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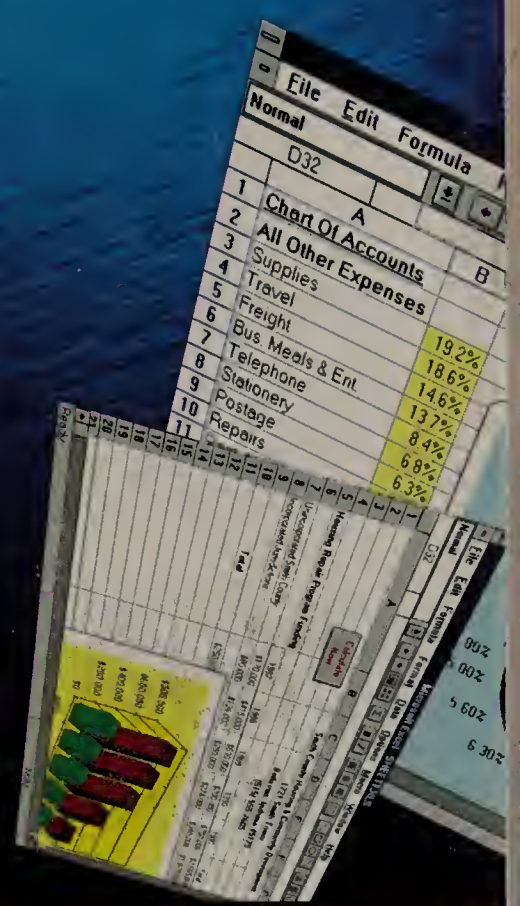

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VALUE ALERT: 20-MHz SX PCs

6 Hot Systems at Fire-Sale Prices

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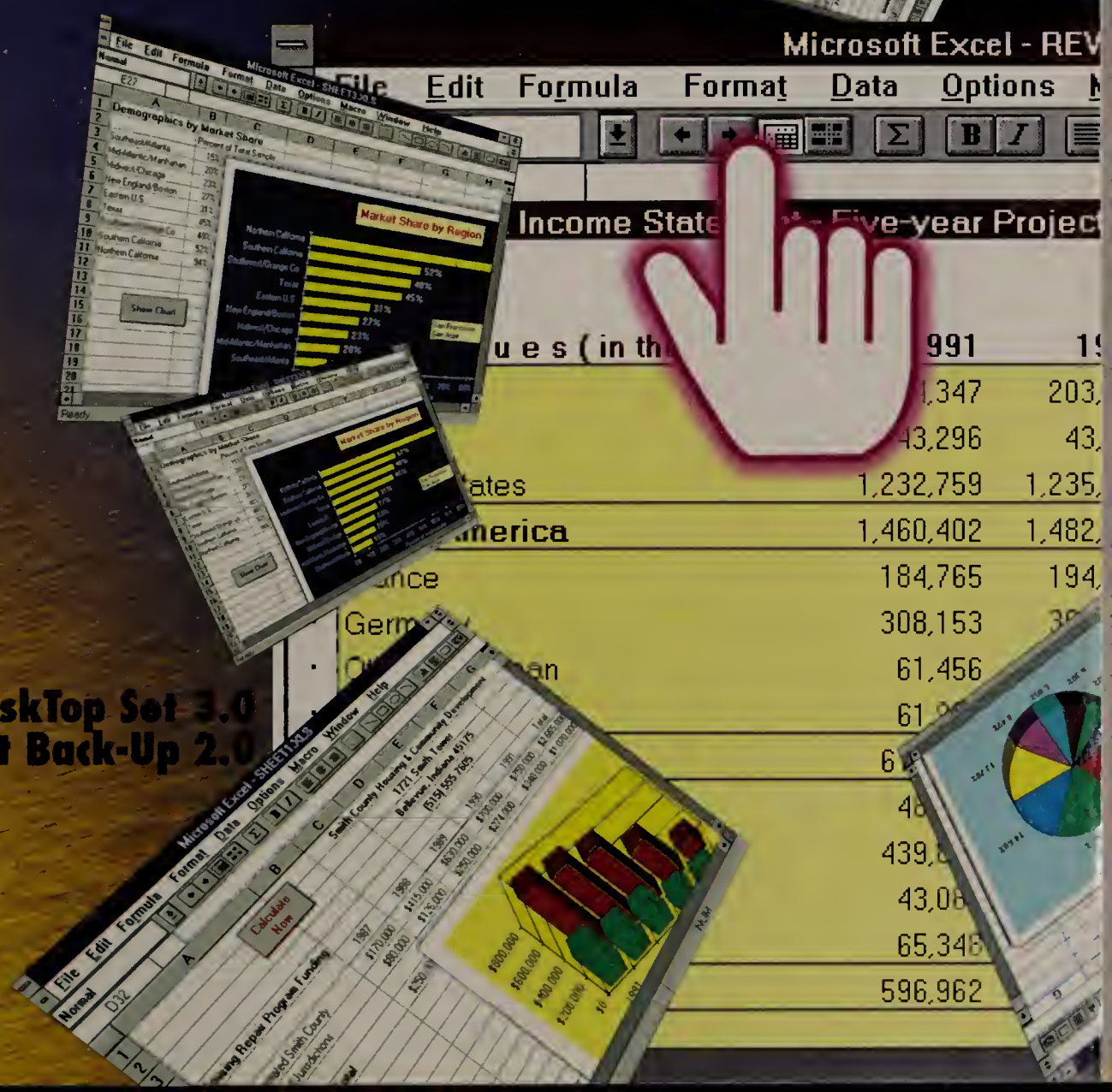
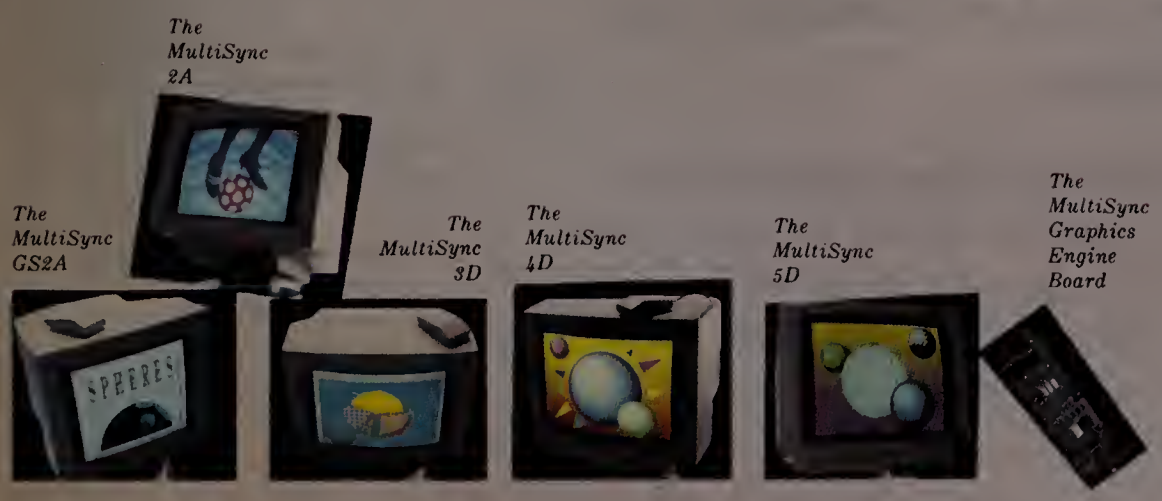


There's really nothing to say about our monitors.



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NEC Monitors Look to the Future

The superb displays of NEC's new MultiSync 4D and 5D monitors por-

MultiSync 5D offers simil

PC FACT FILE EDITOR'S CHOICE

APRIL 10 1990 PC MAGAZINE 163

accelerator software to dramatically boost the speed of Windows and Presentation Manager applications.

The Bottom Line If you use high-resolution graphics and windowing environments, NEC's monitors won't disappoint.

The user-friendly Swiss army knife of multiscanning monitors, the NEC Multisync 3D displays bright, true colors and very sharp text and graphics. All controls are conveniently mounted up front, including microprocessor controlled push buttons for manually adjusting screen size.

Bearing this in mind, our top pick of the products reviewed here is the NEC Multisync GS2A. It has an optional higher resolution than the rest, and the NEC's large, flat screen enhanced viewing with superior glare protection. The higher resolution means

NEC MultiSync 3D

BEST BUY

PROS: Supports all boards, "remembers" screen adjustments, .28mm dot pitch

The Bottom Line The MultiSync Graphics Engine has the power to put Windows or PM into the mainstream.

Overall, the NEC MultiSync Graphics Engine is powerful, versatile, and fast—it is a perfect match either for an NEC monitor or for the high-resolution monitor of your choosing.

MultiSync 2A, MultiSync 3D

"Works Better!"

"Looks Great!"

Seldom does a company dominate a market the way that NEC does with multiscanning monitors, and its latest innovations show why.

That hasn't been said.

I'd take the crisp NEC over the fuzzy IBM image any day.

The Multisync 3D, which includes a 9-pin and 15-pin video cable, is the best of the multiscanning monitors we tested.

PC FACT FILE EDITOR'S CHOICE

NEC MultiSync 4D

NEC Technologies Inc. 1255 Michael Dr. Wood Dale, IL 60191 (708) 860-0335

List Price: $1,699 (cable included)

Requires: VGA, Super VGA, 8514/A or 1,024 x 768 graphics adapter

Diagonal Screen Size: 16 in.

In Short: The 16-inch NEC MultiSync 4D is the smallest product monitor in the MultiSync line to support 1,024-by-768 noninterlaced resolution. It [illegible] its digital memory

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A BEST-TO-SELL WINNER

MONITOR:

NECHE MULTISYNC 2A

With high-performance monitors, quality and reliability may be more important than price. And with so many graphics standards out there, software compatibility is a big issue. The MultiSync 2A 14-inch color monitor from NEC Home Electronics (U.S.A.) delivers on all counts.

If you want a monitor for VGA level and up, the NEC MultiSync 4D is an excellent choice.

Buyers of NEC's MultiSync 2A awarded that monitor the highest scores in the four top-ranked attributes—i

By moving graphics screens at a blistering pace, the Graphics Engine brings improved performance to desktop publishing, CAD, and other graphics applications and

The 4D's approach to storing settings is elegant in the extreme.

FINALISTS

NEC MultiSync 3D, 4D, and 5D monitors

■ Jerry Benson, Tom Grau, Wayne Hinson, Keith Schaefer

■ NEC Home Electronics (U.S.A.) Inc., 1255 Michael Dr., Wood Dale, IL 60191; (312) 860-9500

NEC got out in front first with the MultiSync and stayed there. The 3D, 4D, and 5D monitors are significant additions to the MultiSync family. They add digital controls and automatic recall of user preferences for each video mode to a product line that's already won the Award for Technical Excellence and numerous Editor's Choices. The 4D monitor takes multiscanning into a new dimension: the 16-inch tube may prove to be the perfect size for high-resolution color work in cramped offices.

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February 1991
Volume 9, Number 2

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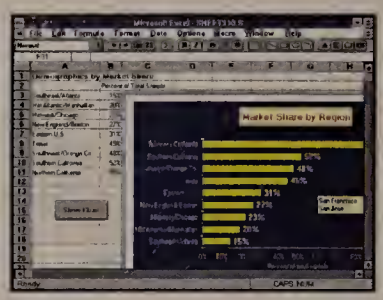

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Cover design by Bill Jensen

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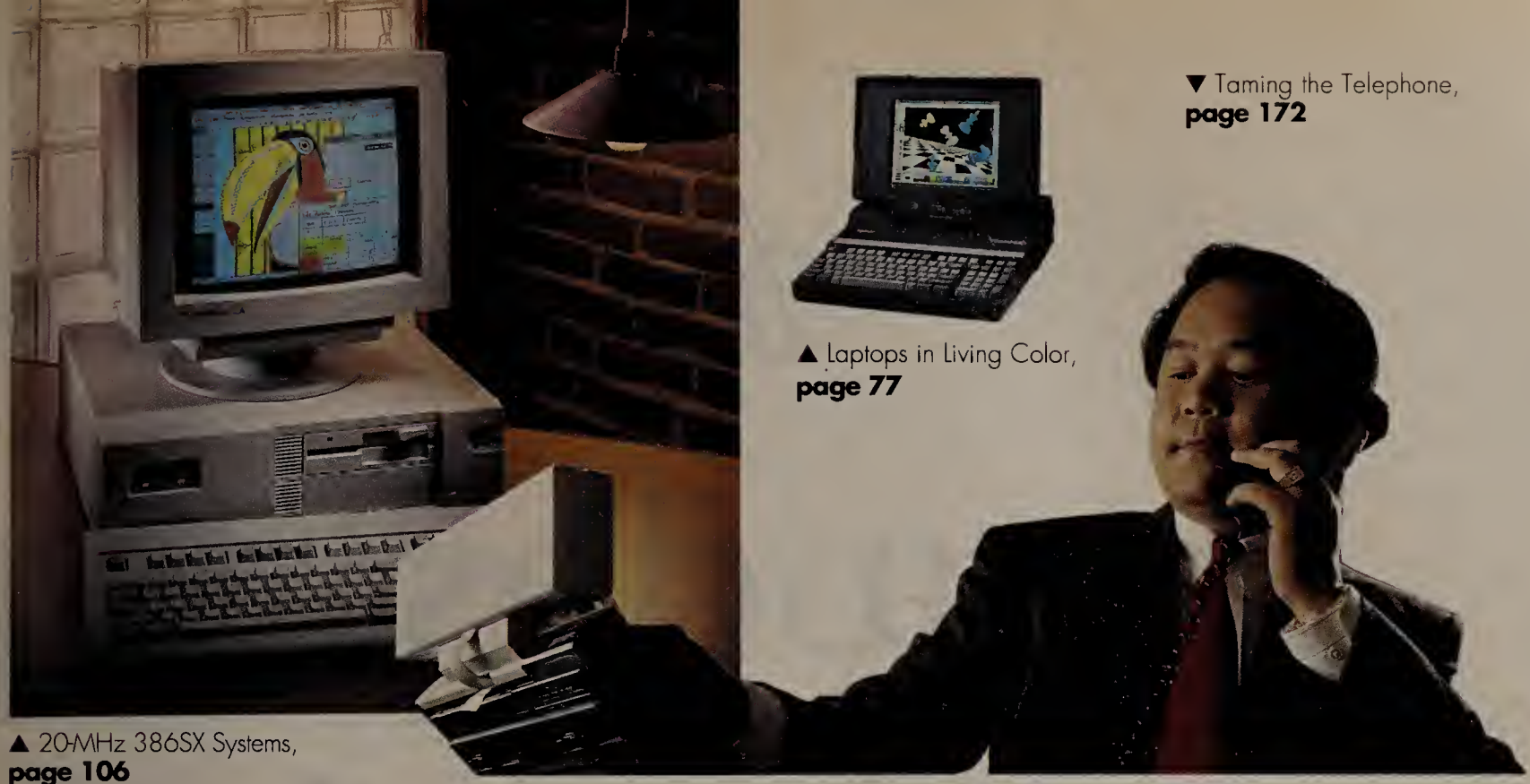

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Introducing the Epson 386SX Notebook Computer.

Until now, opting for a portable computer has typically meant settling for less computer.

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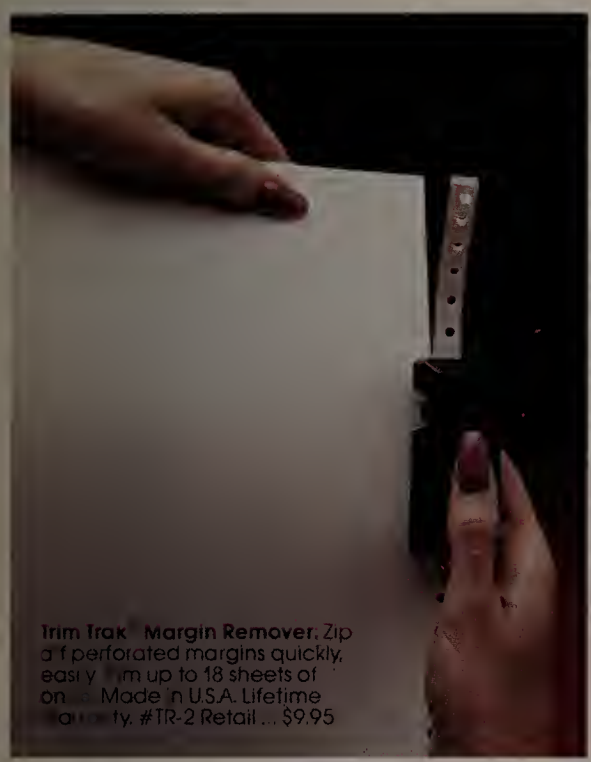

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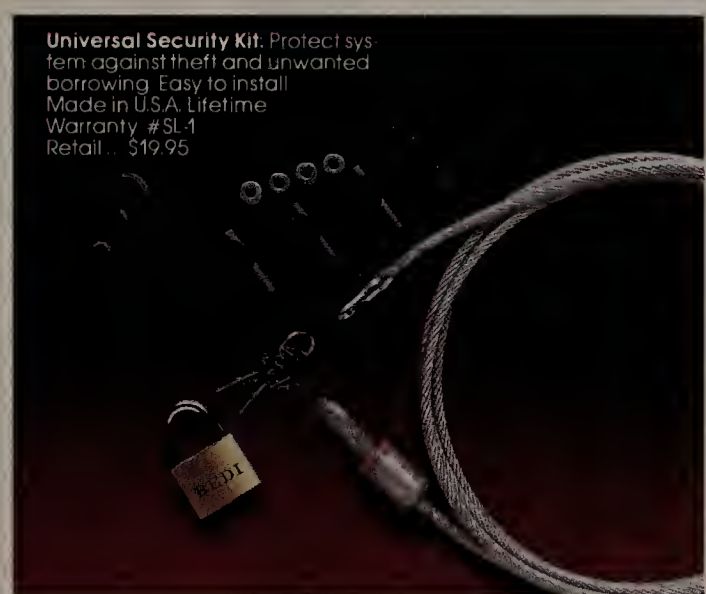

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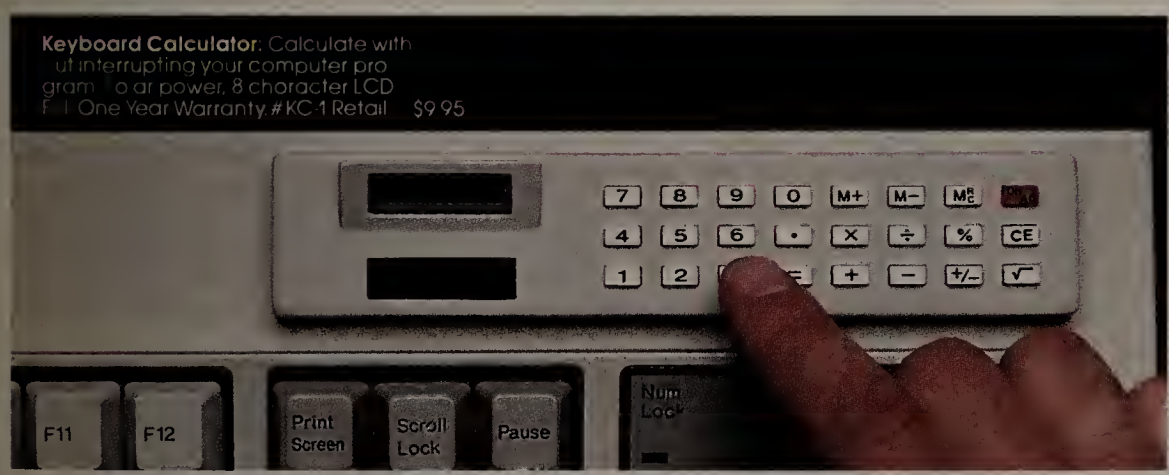

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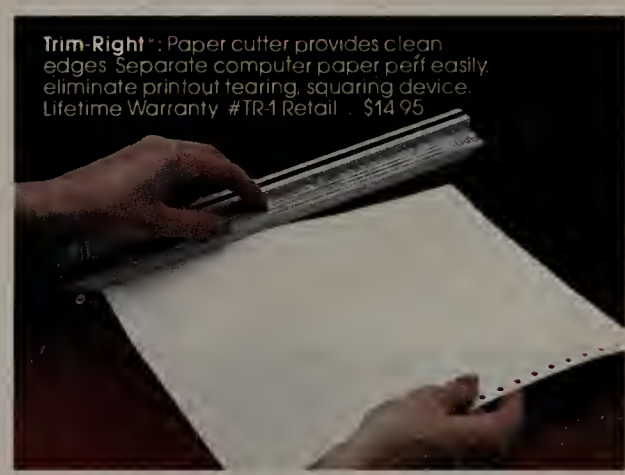

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COAL

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Coal is by far the most abundant fossil fuel, both in the U.S. and the entire world. With continuing growth in population and energy use, it has been speculated that this coal could meet the growth in energy demands all the way until the year 2000, with reserves for 150 years.

Coal has been used frequently by man since prehistoric times, but coal mining itself did not become a major industry until the late eighteenth century and the industrial revolution. Today, there are four types of coal mining procedures mainly used within the U.S. and other countries. Coal that lies sufficiently near the surface is simply Surface Mined by removing the overlying layers of rock. A Slope Mine is utilized when the coal seam lies at moderate depths. An opening that slopes gently permits easy haulage from the mine. Coal that lies deep beneath the ground is reached by steeply sloping or vertical openings called Shaft Mines. Drift Mining is a method used mostly in tough and rugged terrain. In many of these difficult cases, the seam of coal lies along the surface of the earth, completely out in the open, and can thus be mined directly.

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What you need to know about

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The most important localities for diamonds have been in India, where they were mined from the earliest times until the close of the 19th century; South America, where they have been mined since the middle of the 18th century; and South Africa, to which almost the whole diamond-mining industry has been transferred since 1870.

CHARACTERISTICS

A diamond is almost always found in single crystals, which show no signs of previous attachment to any matrix; the stones were, until the discovery of South American mines, almost entirely derived from sands or gravels, but owing to the hardness of the mineral it is rarely, if ever, waterworn.

Some famous diamonds

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This pale yellow diamond was acquired in the early 17th century by the Duke of Tuscany and later became one of the Austrian crown jewels.

Koh-i-noor
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Jubilee
Discovered in 1895, the diamond was named in honor of Queen Victoria's jubilee of 1897.

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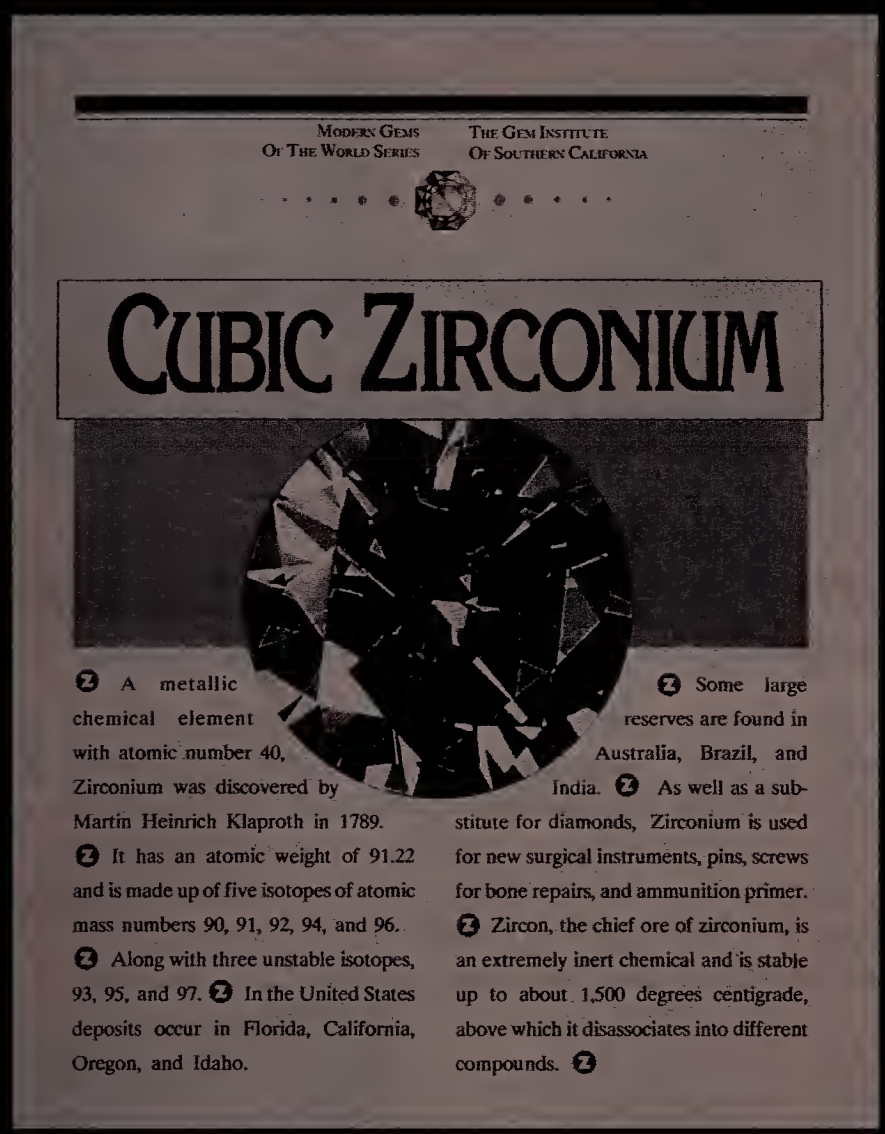
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A metallic chemical element with atomic number 40, Zirconium was discovered by Martin Heinrich Klaproth in 1789. It has an atomic weight of 91.22 and is made up of five isotopes of atomic mass numbers 90, 91, 92, 94, and 96. Along with three unstable isotopes, 93, 95, and 97. In the United States deposits occur in Florida, California, Oregon, and Idaho. Some large reserves are found in Australia, Brazil, and India. As well as a substitute for diamonds, Zirconium is used for new surgical instruments, pins, screws for bone repairs, and ammunition primer. Zircon, the chief ore of zirconium, is an extremely inert chemical and is stable up to about 1,500 degrees centigrade, above which it disassociates into different compounds.

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HEWLETT PACKARD

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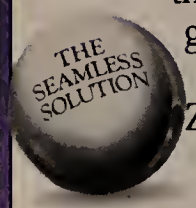

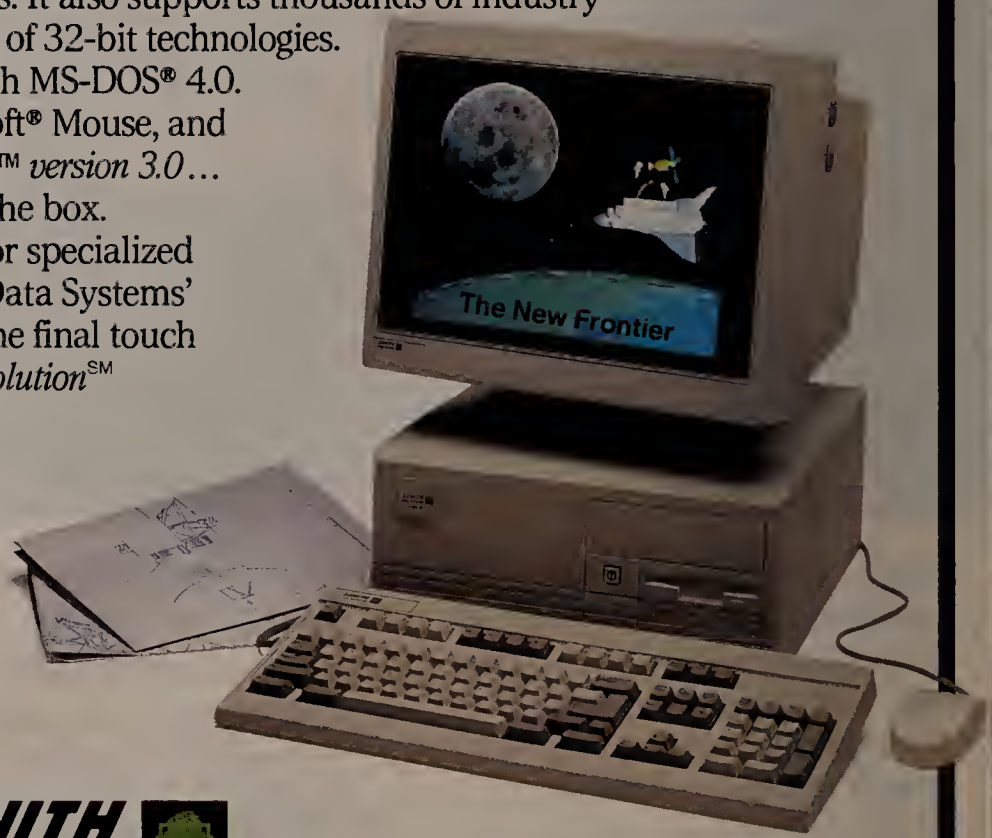

ZENITH data systems

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Circle 290 on reader service card

A man who gets into his work: Contributing Editor Richard Scoville demonstrates Excel 3.0's push-button ease.

WALTER CALAHAN

The Do-What-I-Mean Spreadsheet

What's a *1-2-3* guy like Richard Scoville, our *Spreadsheets (A..Z)* columnist, doing inside an *Excel* worksheet? We inserted him into range D3:H18—and assigned him to write our cover story—for a couple of excellent reasons.

It all began when one of our editors (who for professional reasons shall remain nameless) walked into a windowless room at Microsoft's headquarters, somewhere in the heart of the Silicon Rainforest. He'd seen many a spreadsheet demo before—too many. But when an alpha version of *Microsoft Excel for Windows 3.0* booted up, he knew that he was looking at cover material.

What was it that knocked our jaded editor's socks off? An interface so friendly it practically reaches out and shakes your hand. Sure, you've heard us rave about the wonders of *Windows 3.0* ad infinitum. But *Excel 3.0* isn't simply another program hiding behind *Windows'* pretty face.

In matchless push-button style, *Excel 3.0* answers the common complaint that pulldown menus and dialog boxes actually get in the way of smooth computing. The buttons don't block your view; push one, and the designated command executes in exactly the way you'd expect. Double-click in the right places, and new hypertext-like linking features zip you quickly from cells to formulas, and even to source data in other *Windows* applications.

Excel's new outline approach to worksheet design builds on the key advantage spreadsheets have over data bases—you don't have to establish a formal structure before you start massaging data. You can play with numbers to your heart's content and then use *Excel 3.0's* outlining feature to help extract a structure that matches your needs.

Scoville, an independent training consultant, has seen enough user frustration with spreadsheets to make him eminently qualified to write about the new version. "Most software in most companies is underutilized. *Excel's* new interface makes it more fun and more usable." Interestingly, Scoville believes that "few features in *Excel 3.0* will advance the state of spreadsheet art. The emphasis is on linking and ease of use, not on building more powerful models."

Scoville plans to add the program to his regular training repertoire posthaste. "Over the next year, we'll see a lot of companies moving to *Windows* for *Windows'* sake, for the same reasons people fall in love with the Mac." With the tide of history turning graphical, Scoville knows he'd better catch the wave.

In another historical event, this issue highlights PCs that are really—and we're not kidding this time—really great buys. Usually when a new class of system arrives, we hem and haw and say, "They're fast, but wait until the prices drop." In this month's roundup of 20-MHz SXs, you'll discover that there's never been a better time to buy 386 power.

That's just what you need—a speedy, cost-effective machine to run the latest, greatest spreadsheet. But don't just take our word for it—see for yourself what *Microsoft Excel 3.0* is all about. Mail in the reply card in this issue, and you'll receive your demo disks free of charge.

Eric Knorr
Editor

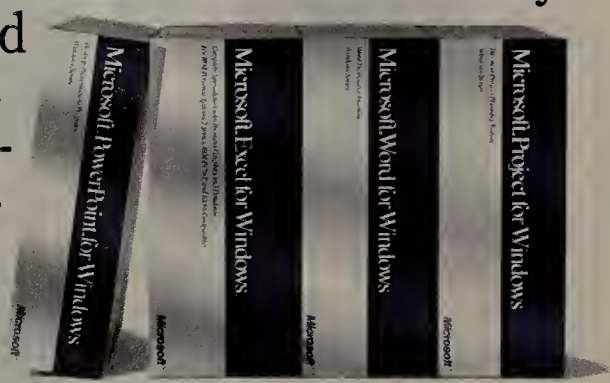
With Windows, the
With our Windows

"Day and Night," by M.C. Escher. Woodblock printed from two blocks, 1938. © 1990 M.C. Escher Heirs/Cordon Art-Baarn-Holland.
For more information, call (800) 541-1261, Dept. P55. Outside the U.S. and Canada, call (206) 936-8661. In Canada, call (416) 673-7638. © 1991 Microsoft Corporation. All rights reserved. Microsoft and the Microsoft logo are registered trademarks and Making it all make sense and Windows are

future takes shape. applications, it soars.

This year, Microsoft® Windows™ version 3.0 lifted personal computing to new heights.

But to see how far Windows can really take you, you'll need Microsoft Windows applications. A superior group of applications specifically designed to get the most out of the Windows environment.

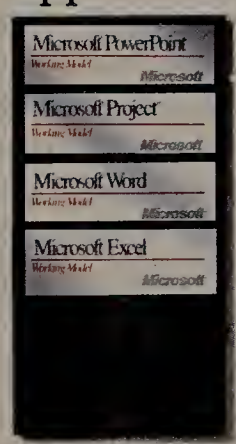


Only Microsoft now offers a family of mainstream Windows applications for business.

Because they work just like the Windows environment, they'll dramatically shorten your learning curve.

Another advantage: there is no difference between what you'll see on-screen and what prints. So feel free to experiment with different font styles. And sizes. And formats.

Then try cutting and pasting. Since our applications work together, moving text, data, graphics or anything else from one to another is a snap.



Windows applications also read files from the software you're already using. Making the switch to Windows computing even easier.

To see for yourself, simply call (800) 541-1261, Department P55, for the free, fully functional Working Model* of your choice.

Before long, you will see just how simple it can be to get your best ideas off the ground.

Microsoft®
Making it all make sense™

*...ademarks of Microsoft Corporation. *The first Working Model you select is free only during our Windows Computing Promotion. One free Working Model per person. Each additional Working Model is $9.95, applicable sales tax not included. Offer good while supplies last and only in the 50 United States.*

LANtastic's™ tiny RAM now has more cards to play with.

If the presence of Micro Channel machines has ever stood between you and the joy of running the award-winning LANtastic PC Network, this is your lucky day. Artisoft has just added three new Micro Channel adapters to its compliment of AE-2 Ethernet, 2Mbps and Voice adapters.

PC MAGAZINE EDITORS' CHOICE March 28 1989 LANtastic

LANtastic AE-2 MC Ethernet for Micro Channel, a 16-bit adapter that can be used in either a 16-bit or a 32-bit slot, is in 100% compliance with IEEE 802.3 and Ethernet standards, and comes with on-board 16K RAM that is user expandable to 64K. Since AE-2 MC Ethernet is software compatible with Novell's NE/2000 hardware, you can run Novell "out of the box."

PC MAGAZINE EDITORS' CHOICE May 29 1990

LANtastic 2Mbps MC adapters are the perfect way to economically network small or midsize businesses with Micro Channel computers. Each card includes a 10Mhz coprocessor and 32K of on-board dual-ported RAM, along with software-selectable IRQ and RAMBASE address settings. Artisoft's version of the NetBIOS standard can be loaded into and executed within the adapter. This plunges the NetBIOS draw on a PC's base RAM down to just 2K and off loads the network processing onto the adapter. The cards are easy to install and use inexpensive dual-twisted pair cable.

LANtastic Voice MC adapters let you save sound and speech onto disk for playback later on Micro Channel machines. Use them with LANtastic NOS 3.0 or above, and you can send voice messages across your LANtastic network. Just pick up the telephone handset provided with each Voice Adapter, bring up a handy on-screen menu, and talk. Use Voice Chat to carry on a real time conversation, or save the message for playback later in your own voice – either through the handset or through the Micro Channel machine's internal speaker.

PC WORLD BEST BUY

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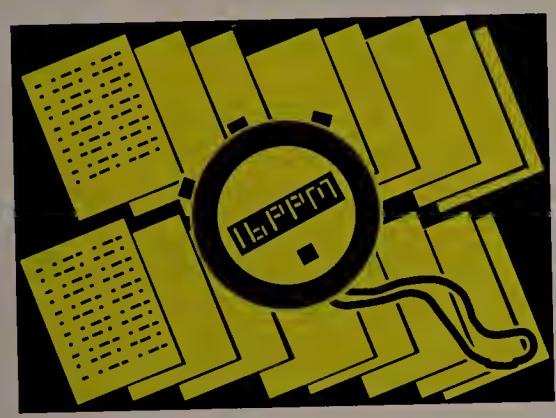
Circle 18 on reader service card

16-PPM LASERS ARE HERE

New Capabilities Answer Work Group Demands



A host of relatively inexpensive 16-ppm laser printers will arrive over the next several months, promising to further drive down prices among all lasers and offer users a wider, if more confusing, selection of printing options. New lasers from Sharp, Texas Instruments, and DataProducts have recently been announced with still-more-significant offerings expected from Hewlett-Packard, Kodak, and others.

Intended both for work groups larger than those served by Hewlett-Packard's 8-ppm LaserJet III and as high-volume print stations for less complex documents, the 16-ppm printers will have features particularly suited to networks, such as simultaneous use of multiple ports and emulations, extensive print spooling, high-capacity paper trays, faster controllers, and longer duty cycles.

The 16-ppm class should not be confused with the pricier 20-ppm-and-up lasers, which have been around for some time and are usually associated with mini-based systems, says Mark Boer, senior market analyst with BIS CAP International. The 16-ppm units are true PC printers that respond to users' increasing network orientation and demand for advanced features—phenomena that divide the market between personal and work group lasers.

Although some 16-ppm printers are likely to command an initial price premium, Sharp already plans to sell its 16-ppm JX-9700 for $3295. (By comparison, the LaserJet III is $2395, while the IIID offers better paper handling for $3495.) Other 16-ppm units may cost as much as $6000, but those devices will offer additional features such as PostScript controllers.

"They will actually redefine the market and push a lot of other things down, including ink jets," predicts Boer. BIS CAP expects sales of 150,000 16-ppm printers this year, compared to 875,000 4- to 6-ppm printers and 968,000 8-ppm lasers.

STORAGE OPENS UP

CD ROM, Erasable-Optical Technologies Make Multimedia Applications Viable

Japan's JVC and IBM are showing optical drives with enough capacity to handle the huge storage demands of multimedia applications.

JVC plans to ship a write-once CD ROM player in the third quarter for a list price of around $2500. WO CD-ROM, one of the first writable-optical drives that fits inside a PC, will let companies cut their own CD ROM disks at about one-tenth of today's cost, aiding the quick distribution of corporate data. More important, says JVC marketing director Richard Young, the 550MB SCSI player provides the storage needed for desktop multimedia applications, such as training or sales presentations. "If the JVC drive performs as billed, it's a very significant development for CD ROM," agrees International Data Corporation analyst Jay Bretzmann.

Meanwhile, in coming months IBM will ship a magnetic-optical drive that lets you read and write 125MB of data on a removable 3½-inch disk. The drive, which analysts expect to cost around $2000, is aimed at day-to-day storage and backup as well as multimedia applications. "We hope that this will be the standard for erasable-optical," says one IBM executive. However, the drive's 85ms access time "is not competitive," comments InfoCorp analyst Bob Gaskin, who points to better performance achieved by Japanese manufacturers.

Analysts expect similar drives from several suppliers this year, although a lack of standard formats for the removable media will slow sales. While these optical drives offer data portability, magnetic drives will continue to be faster and cheaper for the next couple of years, points out Disk/Trend president Jim Porter. But Bretzmann concludes that 3½-inch magnetic-optical "has the potential to be the fastest-growing storage product since the Winchester."

GORDON STUDER

WINDOWS SALES UP

Environment Leads Software Sales Charge

Users considering *Windows* but still not sure if it will fly can take comfort in recent sales reports. These indicate that after many years of trying, Microsoft has finally reached critical mass with its graphical environment.

According to a recent sales audit by the Software Publisher's Association (SPA), *Windows* application sales are leading a strong surge in software purchases overall; they grew a startling 213 percent in third-quarter 1990, compared to the same period in 1989, while total PC applications grew at 24.4 percent. The *Windows* market already is four-fifths the size of the U.S. Macintosh software market. In Europe, sales exceed those of Macintosh packages.

That performance isn't an anomaly, says SPA research director Ann Stephens. *Windows* application sales grew 77 percent and 101 percent respectively during the first and second quarters of 1990.

PC World's own research indicates that more than a third of its readers already use *Windows* and that a third of those who don't plan to install it within six months.

Stephens points to a substantial pent-up demand for graphical applications, with *Windows* the only environment around to fill it. Supply has been constrained by vendors' decisions to write first for the stalled OS/2 Presentation Manager. The number of SPA members developing for *Windows* doubled in 1990.

IBM LAUNCHES 486

Lighter Big Blue Portables Also Expected

While other laptop suppliers are competing furiously to squeeze PC power into ever-smaller, ever-cheaper packages, IBM has gone to the other extreme by introducing a 22-pound luggable with an equally hefty price tag. The PS/2 Model P75 comes with a 33-MHz 486, 8MB of memory, and a VGA gas plasma screen. It costs $15,990 with a 160MB SCSI drive and $18,890 with a 400MB drive.

A handful of price-is-no-object customers such as engineers and accountants do request such power. But analysts point out that it's hardly a niche worthy of the world's largest PC supplier. The fastest-growing, most competitive portable markets are notebooks and intermediate laptops, but IBM is carefully ignoring these segments—as it did with its earlier 386-based P70 line.

Some observers suggest that IBM's unhappy history with the IBM Portable and PC Convertible makes it hesitate to enter the raucous notebook market. "IBM recognizes its limitations in developing products fast enough to keep up with everybody else in the low end," says Paul Zagaeski of The Yankee Group.

However, this is far from the last word from IBM, other analysts say. "IBM will make a major attempt to become a significant player in portables, with a broad range of products," says InfoCorp analyst Stella Kelly. She predicts a lighter IBM portable will arrive in the first quarter.

Others note that IBM doesn't have to be first in order to claim the lion's share—for example, its SX-based Model 55 SX debuted almost a year after Compaq's but now is the world's best-selling desktop computer. James Cannavino, head of IBM desktop systems, calmly predicts that IBM will hold the leading market share for portable PCs by the end of the year.

PCL-5 CLONES ARRIVE

Emulations Boast Speed, Lower Cost

They've taken a lot longer than anticipated, but the first emulations of PCL-5, the printer control language in Hewlett-Packard's LaserJet III and IIID printers, were scheduled for January release.

Destiny Technology Corporation has shipped its LaserAct 5 software/hardware technology to five large Japanese printer makers, including Tokyo Electric Company, which was releasing a PCL-5–equipped printer to manufacturers in January. Also scheduled for January: Abaton's 6-ppm LaserScript P5 printer, which uses Phoenix Technologies' Phoenix Page LJ III/PLI. The Phoenix Page technology is also the basis of a planned Pacific Data Products upgrade cartridge. Additionally, Personal Computer Products is readying a PCL-5 emulation that it plans by March to license to others and to use in its own printers.

Makers promise 100 percent compatibility with HP PCL-5 and its major features, including on-the-fly font scaling, rotation of text and images, mirrored text, and shading. All the clones license HPGL-2 for graphic imaging as well as the Agfa Compugraphic Intellifont font-scaling code found in HP's original version.

What most lack is the Resolution Enhancement Technology that HP builds into its printers, which eliminates "jaggies" on the rounded edges of text. However, Destiny's LaserAct 5 includes custom circuitry with its own dot modulation scheme. Another unannounced U.S. printer maker also plans to add its own RET-like capability to its peripherals in January.

Destiny vice president of sales and marketing Louis Yang claims that his manufacturers can offer PCL-5 capability with 25 percent better performance and 25 percent lower cost than HP. Other suppliers, however, are somewhat less optimistic, noting the LaserJet III's aggressive $2395 price tag. Abaton insists it will beat the HP price.

OLE SPEC ANNOUNCED

Windows Integrator for File Links, Modular Apps

Users of *Windows* applications will soon be able to create compound documents by embedding data "objects" created by other *Microsoft Windows* applications and/or linking to those objects in other files.

The *Windows* Object Linking and Embedding (OLE) specification will be supported by *Microsoft Excel 3.0,* scheduled to ship in January, as well as *Lotus Notes 2.0,* due this quarter. Microsoft also will incorporate OLE in *Windows 3.1,* due in June. In addition, Aldus, WordPerfect, and Micrografx (all of whom co-developed the specification with Microsoft and Lotus) and other leading applications suppliers will include OLE in new versions of their *Windows* products, whose release dates are not yet public.

OLE will let a *Windows* user reach out from, for example, a word processor, either to retrieve or to link a graph, spreadsheet range, drawing, or other object created by another OLE-compatible application. Changes to one of these objects, explains Microsoft operating system evangelist Viktor Graebner, can be made by double-clicking on the object, which activates the application that created it. All these functions should take place without user involvement and without significant memory overhead.

"We are very impressed," says Micrografx chairman George Grayson, who hopes to have OLE in upgrades of Micrografx's *Designer* and *Charisma* graphics programs by midyear. "By the time of *Windows 3.1,* there will be a lot of applications using this, including most of the important ones."

Grayson adds that OLE is a necessary step in letting developers build slimmed-down, modular applications that focus on what each does well. Once that practice becomes prevalent, users will be able to build applications by combining the core functions of their favorites. That means that, say, users of draw or electronic mail programs will be able to use their own text editor rather than the one supplied, and that spreadsheet users can employ a charting program other than the one that comes with the spreadsheet.

GORDON STUDER

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AND IN SOCORRO, NEW MEXICO...

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Everywhere you look these days you'll find Gateway 2000 computers. That's because people everywhere know a good value when they see one. In all 50 states and in over 70 foreign countries, thousands of people are comparing price, quality and service – and choosing Gateway 2000.

In Gothenburg, Sweden

Anders Bjernefors, a computer dealer and programmer, bought a Gateway 2000 25 MHz 486 system last April. "After many faxes and a lot of study, I selected Gateway 2000," said Anders. "I'm pleased with the machine. I received a very powerful, well-built computer for an astonishingly low price."

Computer Link 2000 25 MHz

Anders was so impressed by his system and by the people at Gateway that he contacted the company about becoming a Gateway 2000 reseller. "I telephoned my salesman," Anders remembered, "and he told me I'd have to visit the factory to make the arrangements. I was on the next plane out of Goteborg on my way to North Sioux City, South Dakota."

In Worland, Wyoming

Bob Borst, owner and operator of Cloud Peak Pest Control in Worland, spent two and a half months researching his computer purchase. He chose a Gateway 2000 386SX.

Bob Borst, owner and operator of Cloud Peak Pest Control, and his Gateway 2000 386SX.

"My final decision was based on people, not hardware," said Bob. "The Gateway people make you feel like you're the most important person in the world. I didn't buy a computer – I bought Gateway."

Bob was equally impressed by Gateway's service people. "One time I got into a file and couldn't get out of it," Bob related. "Even though it was a software problem, I called Gateway and they talked me through it."

In Socorro, New Mexico

Gordon Kane, Laboratory Associate at New Mexico Tech, runs a computer lab with 15 Gateway 2000 286 systems. "At first we bought Gateway's because of the good prices," said Gordon. "But now I buy them because of the technical support, which is very superior, and because the company is committed to improving its product line."

Gordon Kane, New Mexico Tech, with his Gateway 2000 286 lab computers.

NMT also uses Gateway computers in its research programs. "A Gateway 386 cache system will be used

Intel 386 is a trademark of Intel Corporation

Choose Gateway 2000!

at Kennedy Space Center next summer," said Gordon, "as part of a large program of thunderstorm studies being conducted there by NASA and the Air Force."

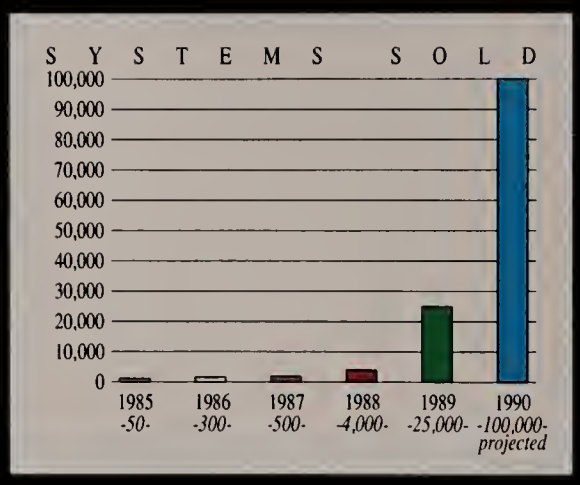
PC Magazine's survey about service and reliability confirms what these customers are saying:

"Gateway shared top billing with such heavyweights as Compaq, IBM, and HP for those who would buy their products again...Overall, Gateway's high marks bode well for the company's future, as does its commitment to customer service."

PC Magazine
September 25, 1990

From the Heartland

The combination of price, quality and service makes Gateway 2000 the best value in the industry. But value alone doesn't explain how a little company in the Midwest, just celebrating its fifth anniversary, managed to outdistance hundreds of other companies, selling more systems through the direct market channel than any other PC manufacturer in the country.



Gateway 2000 sells more computers through the direct market channel than any other PC manufacturer in the country.

"It was the cows," laughed Ted Waitt, Gateway 2000 President and CEO. "Of course." Computer magazine readers will remember the company's early ads featured a picture of the Waitt cattle farm with the headline, "Computers from Iowa?"

"We can't run that ad anymore," continued Ted, grinning, "because we built a new plant 14 miles down the road in South Dakota. But the cows really worked for us. They made the phones ring. From then on, though, we built our business on value – good prices on quality systems with old-fashioned, personal service."

Ted mentioned another reason for Gateway's success. "We take a long-term approach to customer service," he said. "When you buy a computer from Gateway 2000, you become part of our family and we're going to be there for you as long as you own that machine."

"In the computer industry, longevity should be measured in dog years."

As Ted talked about the company's fifth anniversary, he laughed again. "In the computer industry, longevity should be measured in dog years," he chuckled, "because everything's moving so fast. That makes Gateway 35 years old! But seriously, we've come a long way in five years. And I owe it all to the great people at Gateway and to our customers."

Gateway 2000 will be [illegible] you 'til the [illegible]

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Windows: A Reality Check

Why are we so crazy about Windows? Why are you?

"*Windows...Windows...Windows!!!* Enough already!!!"

That impassioned plea stood out from a stack of recent letters I got about the articles and opinions in *PC World.* One thing magazine editors learn quickly: When readers take the time to write, it's time to pay attention.

The writer bashed *PC World*'s in-depth coverage of *Windows*—"applications with *Windows,* hardware with *Windows,* every possible topic that involves computers and *Windows.*" Had we flipped our lids over *Windows?*

Maybe we have. But then again, maybe you have too.

The Numbers Tell All

When you look at the *Windows* scorecard, it's hard not to be impressed. According to the Software Publishers Association, sales of *Windows* application software soared by 135 percent in the first nine months of 1990 over the same time frame in 1989. Most of the buying took place in the bread-and-butter product areas of word processing and spreadsheets, too—a signal that users are making the switch to *Windows* as their main work environment. Another signal: *Windows* software sales approached those of the Macintosh for the first time ever in 1990 (see "Windows Sales Up" in *Top of the News* in this issue).

More important, users seem determined to rush headlong toward *Windows* in 1991. While about 35 percent of *PC World*'s readers said they were using *Windows* at the end of 1990, nearly 75 percent said they plan to use it by the end of 1991. Almost 50 percent of those plan to buy a *Windows* word processor, 44 percent a *Windows* data base, 42 percent a *Windows* graphics package, and 40 percent a *Windows* spreadsheet.

Nearly 75 percent of PC World's readers plan to use Windows by the end of 1991.

By any standard, these numbers rate as compelling proof that there's a revolution afoot in the PC world. But they also add new urgency to my irate correspondent's point: Why is everybody suddenly rushing to *Windows?* What's the big deal?

It's All About Information

At last fall's COMDEX PC industry trade show, we asked *PC World*'s User Group Advisory Board to tell us how fellow user group members across the nation felt about *Windows.* Although they reported that a lot of users were actively exploring the environment and evaluating its applications, nobody painted a particularly rosy picture. Users are having a hard time configuring *Windows* to run effectively on their systems, and many haven't experienced any greater benefit from *Windows* software than from its character-based equivalents.

These problems aren't lost on *Windows'* creator, Microsoft. At the same COMDEX where our board members issued their mixed *Windows* report card, Bill Gates outlined a vision for *Windows* grounded in the notion that users need more from graphical software than just warmed-over versions of the same old PC programs. He called this vision "Information at Your Fingertips." At root, it's a call for standards to make programs easier to use individually, simpler to combine for handling a person's specific applications, and more powerful so that information can flow freely from one part of an organization to another.

Gates' vision is just beginning to unfold, but a program like *Excel 3.0* provides a good road map to the future of PC software. *Excel*'s new push-button interface sets a standard for simplicity and directness that other *Windows* programs are bound to follow. It implements the new Microsoft spec for object linking and embedding (OLE)—an in-

(continues)

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Circle 153 on reader service card

dustrywide standard that allows users to combine *Windows* programs from any vendor to create electronic documents that can be updated or changed at will (see "OLE Spec Announced" in *Top of the News* in this issue). And its advanced features make it simple to analyze spreadsheet information from throughout an organization and to access various kinds of corporate data. You can take the future for a spin by checking out *PC World*'s exclusive *Excel 3.0* Test Drive offer in this issue.

The Next Step: Microsoft Conquers the Mac?

Microsoft is going to great lengths to ensure that "Information at Your Fingertips" turns out to be more than an empty phrase. That commitment is a source of concern to some who think that Microsoft already has too much power to set the PC agenda. But you can't argue with the company's logic. For example, Microsoft is planning to implement the OLE spec for Macintosh applications, enabling users to trade live electronic documents between Macs and PCs. If Microsoft succeeds, then in the process it will wrest control from Apple of a crucial piece of the Mac operating system. Yet think how a specification tying *Windows* and Mac programs together would help to solve the integration problem that companies like General Electric face every day (see "The Windows-Mac Connection" in this issue).

I have a feeling frustrated users are a lot more interested in results than in politics. Companies are buying into *Windows* on the promise that it will radically alter the way they use PCs. It's going to take a cooperative vision from vendors to make it happen, and eternal vigilance from users to ensure that the payoff measures up to the hype.

As always, I'm interested in your opinions on this or any other subject. Write to me at *PC World*, 501 Second St. #600, San Francisco, CA 94107; fax 415/442-1891; MCI Mail Richard Landry/301-3685.

dTruth Comes Out.

Software Digest RATINGS REPORT®

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Volume 7, Number 13

MULTIUSER DATABASE PROGRAMS

Ratings Key: ■ 7.0–10.0 ■ 5.0–6.9 ■ under 5.0

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Tested	Performance	Versatility	Error Handling	Ease of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreements	Page
★★★	7.0	6.7	dBase IV	1.1	■	■	■	■	■	450KB	$795	✓	28
★★	6.8	5.1	Paradox	3.5	■	■	■	■	■	640KB	$995	✓	32
★★	6.8	7.1	FoxPro/LAN	1.02	■	■	■	■	■	512KB	$1,095	✓	30
★★	6.4	5.1	DataEase	4.2	■	■	■	■	■	640KB	$750	✓	26
★	5.8	3.6	R:Base	3.0	■	■	■	■	■	520KB	$995	✓	34
★	5.7	6.0	Clarion Professional Developer	2.1	■	■	■	■	■	512KB	$845	✓	24
★	5.7	6.6	Advanced Revelation	2.01	■	■	■	■	■	640KB	$995	✓	22

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The new dBASE IV® version 1.1 has been rated the #1 Multiuser Database by Software Digest Ratings Report (Volume 7 Number 3, October, 1990).

Because Software Digest accepts no advertising whatsoever, subscribers pay hundreds of dollars a year to receive their reviews—which are considered highly unbiased and objective.

In summation, their 75-page report says: "Among the top ranking programs, dBASE IV (version 1.1) is the most well rounded, with solid performance, versatility, and usability." Commenting on speed, Software Digest points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use/Ease of Learning, dBASE IV scored as many times in the Excellent range as any other database product tested.

Of course, Software Digest is definitely not alone in its conclusions.

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Ashton-Tate®

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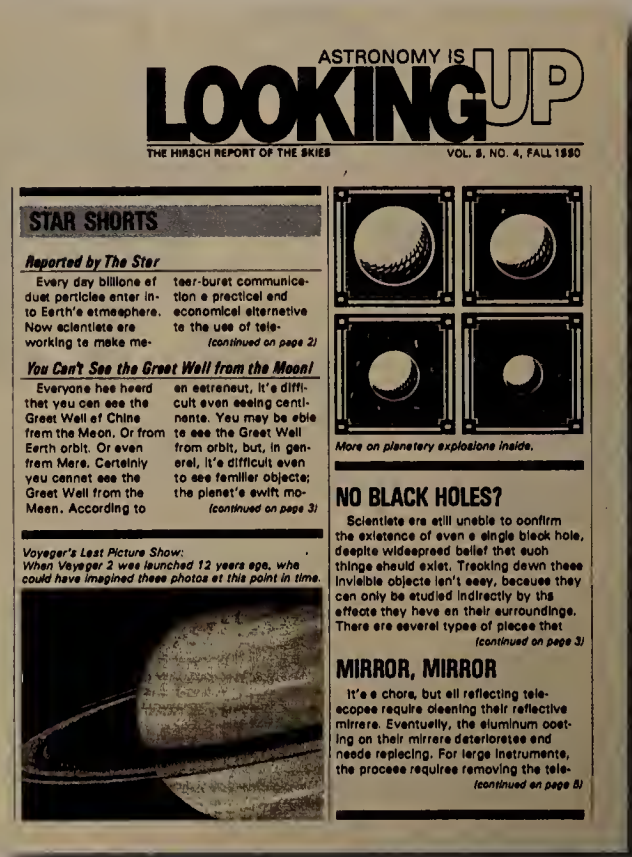
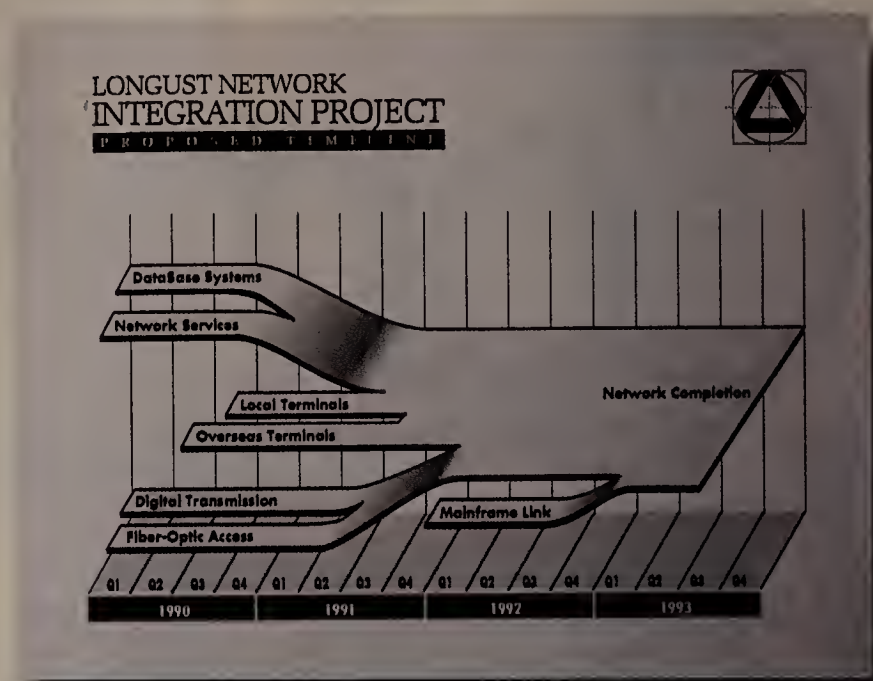
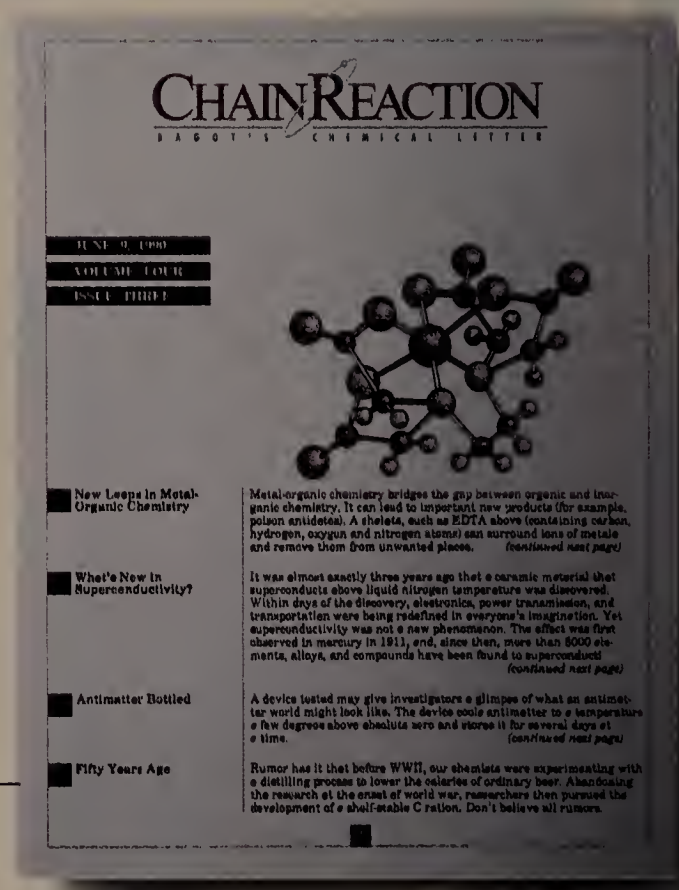
If you think the HP LaserJet III is great,







Introducing the new HP LaserJet IIID printer. The LaserJet that combines all of the advanced capabilities of the exciting LaserJet III with all of the paper-handling features required by today's busy office.

There's a lot to like. Like two paper trays for different types and sizes of paper. 200-sheet capacity in each of those trays for less reloading. And two-sided printing that lets you easily condense your output. Even an optional automatic envelope feeder that eliminates manual feeding.

Equally impressive is HP's Resolution Enhancement technology. Pioneered in the LaserJet III, this technology actually varies the sizes of dots. So curves really curve. Lines are never jagged. And you get resolution never before seen in a 300 dpi printer. Output has never looked so good.

Documents can be made even more elaborate thanks to our en-

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you'll automatically like the new HP LaserJet IIID.

hanced PCL5 printer language, which includes HP-GL/2 graphics language. You can print regular or reverse type. Shaded text. Even portrait and landscape on the same page.

Beyond this, all types of options are available for all types of users. Which means you can customize with Adobe® PostScript® software. Add memory. Or better express yourself with our MasterType library of fonts and typefaces. You can even connect a Macintosh.

The best part is that the $2,395* LaserJet III and $3,595* LaserJet IIID are both easily within any budget. So call **1-800-752-0900, Ext. 1586.** We'll tell you where to find your nearest authorized HP dealer.

HEWLETT PACKARD

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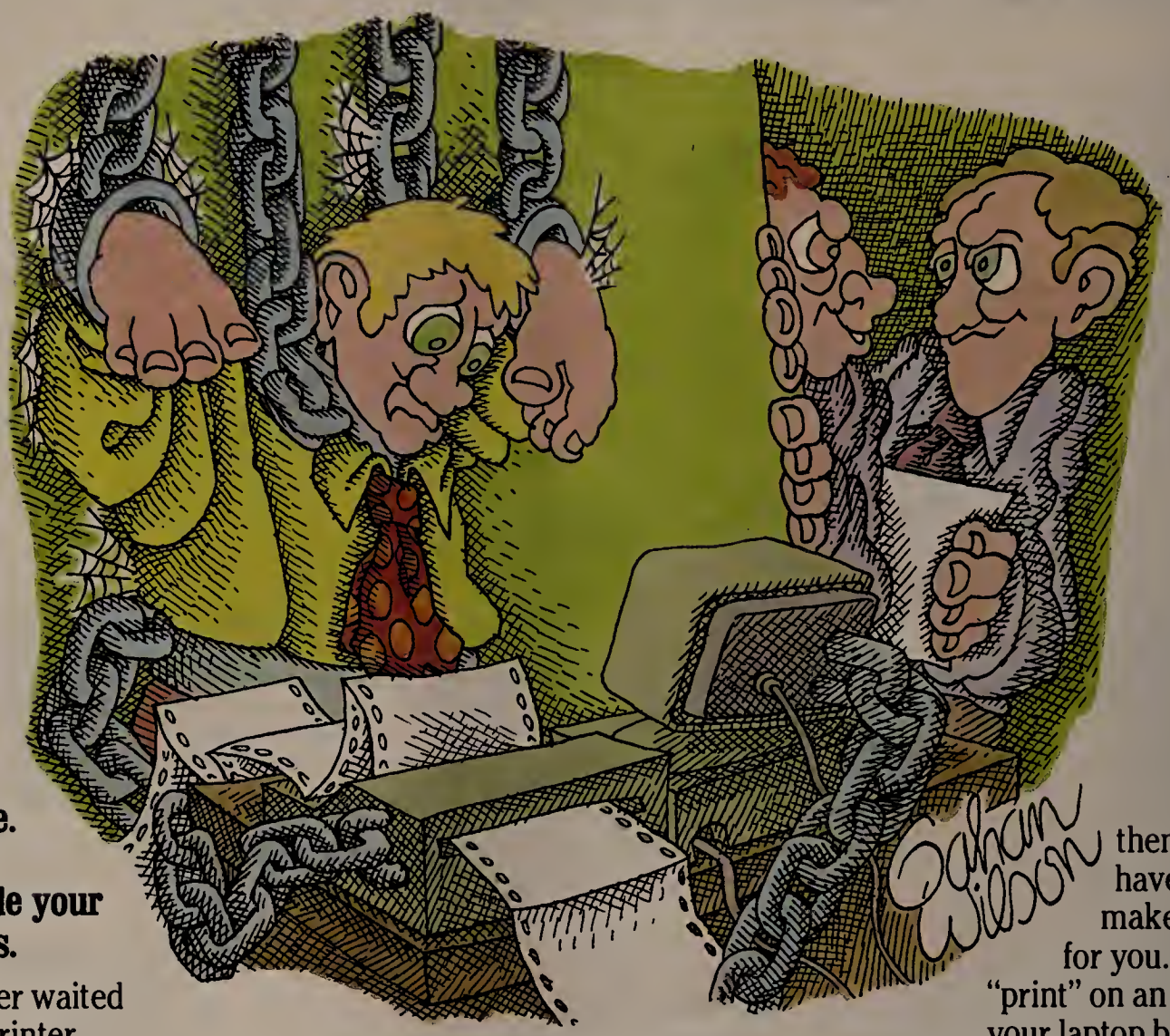
Still hanging around, waiting for your spreadsheets to print?



"Obviously Fenwick hasn't discovered P.D.Queue yet."

Get P.D.Queue. And keep on working while your printer prints.

If you've ever waited idly for your printer to finish a spreadsheet, then here's a product that's been worth hanging around for.

P.D.Queue is the add-in print spooler for all kinds of printing with 1-2-3 and Symphony. Including Allways and Sideways® printing.

With P.D.Queue, you get back control of your computer seconds after starting a printout. Without waiting for your printer. Without doing anything different.

Just print as usual in 1-2-3, Symphony, Sideways, Allways, or any other add-in, and P.D.Queue takes over automatically. Sending your files to your hard disk—which takes just seconds—instead of to your printer—which could take minutes. While you're back at work, P.D.Queue takes care of printing for you. Silently, in the background.

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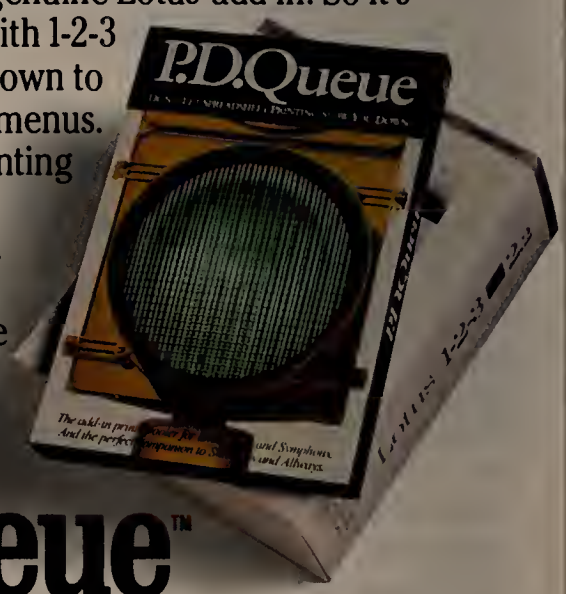
And P.D.Queue is a genuine Lotus add-in. So it's perfectly compatible with 1-2-3 and Symphony. Right down to the familiar Lotus-like menus.

So if spreadsheet printing is hanging you up, let P.D.Queue set you free.

P.D.Queue is just $89.95 at your software dealer, or direct from Funk Software.



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LETTERS

Reactions and responses from the PC World community

TIM GRAJEK

Resourceful Readers

As a recent subscriber to *PC Resource* who is now receiving *PC World*, I want to thank you for a magazine that seems to be covering all aspects of the PC spectrum, not just the corporate high end. What I see in my first issue looks good. Thanks again.

Ronald R. Kelley
Chatsworth, California

As a *PC Resource* and *PC World* subscriber, I like your magazine very much. I enjoyed *PC Resource*'s DOS inserts, and I miss them. But you have your *Instant Reference Cards*, which are very helpful. I particularly appreciate being able to look up a command in the card binder rather than having to page through a 500-page book.

Charles Cabral
Coventry, Rhode Island

ANTHONY RUSSO

There's Just No Accounting...

When I read "Budget-Wise Accounting" in November, I was blown away to see you name *Pacioli 2000* a Best Buy. Frankly, I never expected a glossy business magazine like *PC World* to recommend my favorite bargain-basement package. Of course, it was no surprise to see you honor the excellent *BusinessWorks*. Here's a consultant with his hat off to your sound judgment. Great job!

J. B. S. Kenyon
Cincinnati, Ohio

As an accountant and software consultant, I appreciate your efforts to evaluate accounting packages. But I think it imperative to state that software is an accounting aid and is *not* able to make accounting decisions. I was alarmed when you indicated that you wished for more leeway in choosing items to include on statements—I'm sure several loan officers fainted on the spot. All we need is small-business owners taking fabricated financials to lending institutions. I've made much of my income by solving problems started when clients tried to automate accounting while using untrained personnel. Still, you have a great magazine; keep up the good work.

Jeff D. Hardee
Nashville, Tennessee

Installation Explanation

I enjoyed "Thanks for the Memory," your November article on installing *Windows 3.0*. Personally, I avoid installation problems by installing first from a bootable floppy: I format a disk with FORMAT/S, then add FDISK.COM, FORMAT.COM, and an AUTOEXEC.BAT file containing the line 'prompt pg'. I also rename and put my regular AUTOEXEC.BAT and CONFIG.SYS on the disk. If the program installs and runs without mouse drivers, TSRs, or memory drivers in RAM, I load my regular AUTOEXEC.BAT and CONFIG.SYS files and reboot. If there is a problem, I start removing individual lines until I pinpoint it.

Howard Wexler
Riverdale, New York

Remotely Supportive

I think that in your October "Who Pays for Tech Support?" you overlooked an important area. There was no discussion of the kind of remote support that can be provided by vendors through the use of remote software packages. With purchase of our *GarageKeeper Automotive Software*, for instance, we include voice, BBS, fax, and remote support for the first 90 days. The early support covers installation problems, conceptual problems, and pilot error. The ability to remotely diagnose the problem and reconfigure the system to correct it is extremely valuable. The customer is back running with little lost time or frustration.

Miles J. Swift
President
Computer Assistance Inc.
Creswell, Oregon

New Reader's Newkey

I just saw your magazine for the first time, and I was happy to see that *Newkey 5.2* made your October "Best of Shareware 1990" list. I started using it

(continues)

about a year ago, and I prefer *Newkey*'s economical keystrokes to *WordPerfect*'s macros. I use *WordPerfect* macros only when I need advanced programming. I find *Newkey*'s shorthand mode really useful in my medical transcription business. For example, I can type 'bp'and hit one delimiter key, and *Newkey* types out 'blood pressure'. I don't know how I ever got along without it.

Kathy Ferneau
Urbandale, Iowa

BASICAlly Correct

After trying your October BASICA menu program on page 228, I found that in line 180, the apostrophe should be preceded with a colon. I want to add that I really appreciate the How To section. Our accounting assistant liked the *1-2-3 Instant Reference Card.* And in general, our office loves these helps and hints. They aid us in doing our jobs efficiently (my boss told me to say that) and make us look good (I told *myself* to say that). Keep them coming!

Sue Ulintz
New York, New York

Clarifying the Outlook on DataEase SQL

Thanks for including *DataEase SQL* in the October *Product Outlook.* The piece is largely accurate, but I'd like to clarify two points. The only user who "need[s] to know on which server...tables are located" is the application developer. Users don't need any knowledge of servers or data location. Also, users can manipulate data with the full range of relational operators without first copying data to their PCs. Our features ensure that relational processing is executed within the server. This is an important distinction from other client-server front ends, which require data to be copied to the PC before basic relational operations can be executed.

Fred Holahan
Director, Product Marketing
DataEase Int'l, Inc.
Trumbull, Connecticut

Corrections and Clarifications

Our December "Upgrades for the '90s #8," on page 207, should state that the MicroWay FastCache-SX board gives 85 percent of the speed of a comparable 386DX PC. The vendor says it has corrected the potential SCSI drive conflicts we reported.

The correct list price for the Network Connection Triumph SX from The Network Connection listed in December's "Buyers' Guide: 16-MHz SX Systems" is $2498. *PC World* regrets the error.

Send your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Include your name and the name of your city and state. We reserve the right to edit letters.*

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Model	3436	5468	5432	5439
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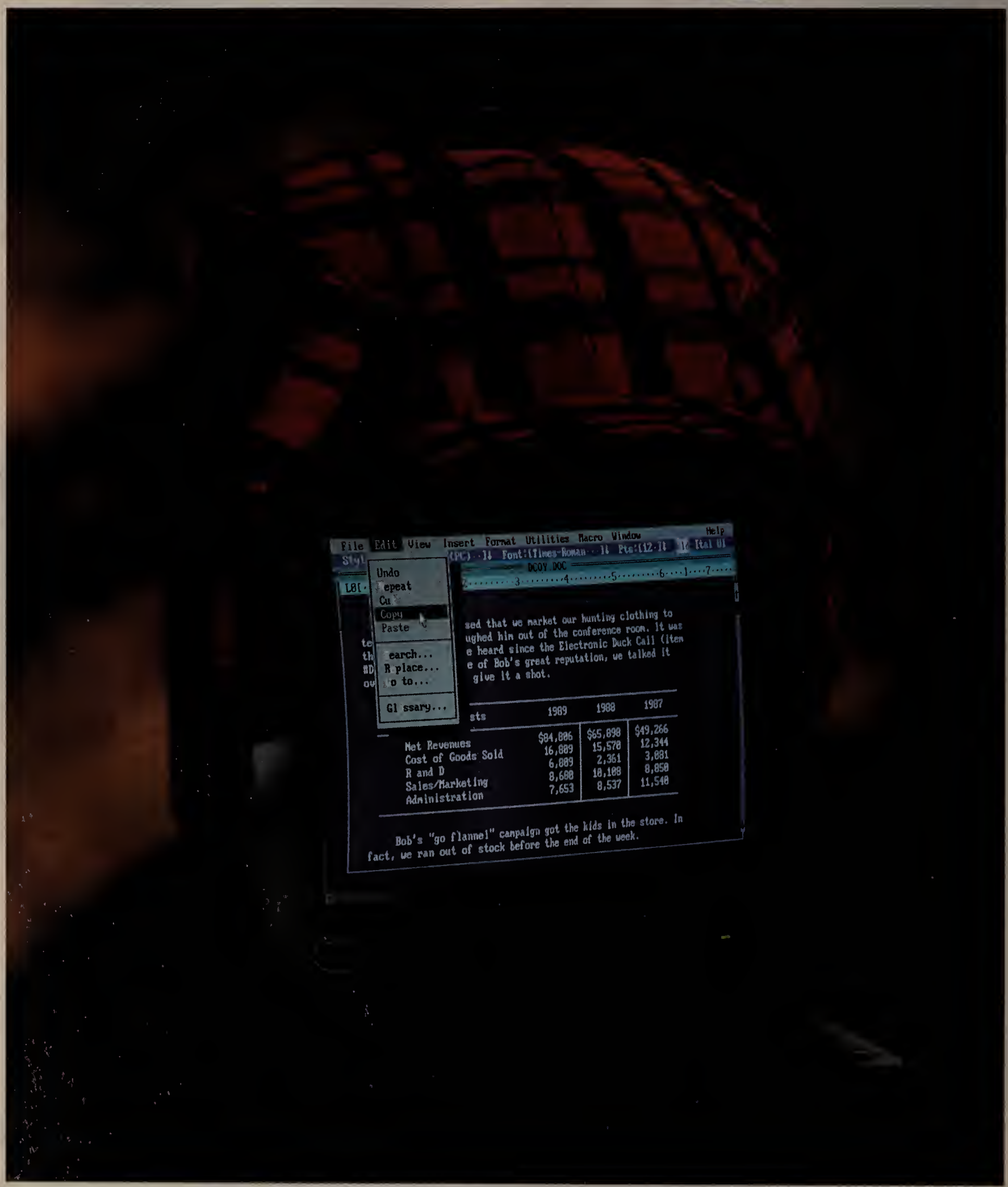
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sed that we market our hunting clothing to
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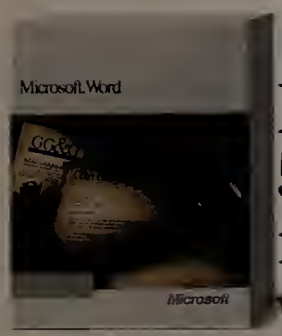
e of Bob's great reputation, we talked it
give it a shot.
1989 1988 1987
Net Revenues $84,806 $65,898 $49,266
Cost of Goods Sold 16,889 15,578 12,344
R and D 6,889 2,361 3,881
Sales/Marketing 8,688 10,188 8,858
Administration 7,653 8,537 11,548
Bob's "go flannel" campaign got the kids in the store. In
fact, we ran out of stock before the end of the week.

ason is over.



We created new Microsoft® Word version 5.5 with a certain aim in mind: make powerful word processing features easier for you to find and use.

Which is why we've outfitted it with a new interface that's both intuitive and visual.

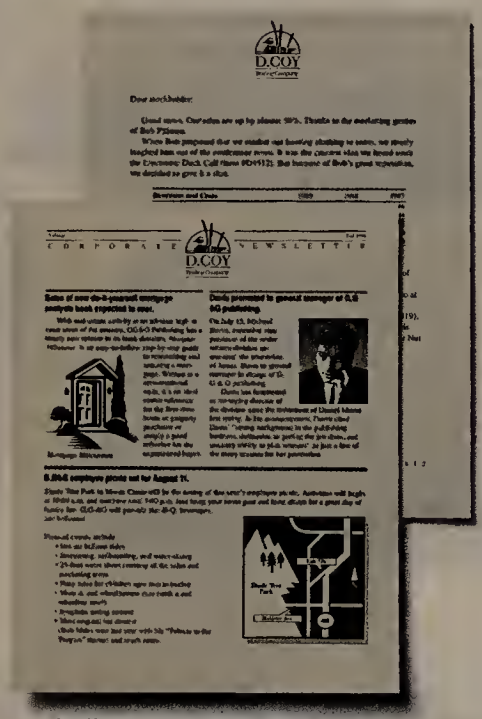
Smartly designed pull-down menus and dialog boxes now allow you to quickly access Word's familiar powerful features. Like dynamic tabs, programmable macros, outlining and styles. Then, to make everyone more productive, there are annotation and group document management features.

But not only can you bag more features, you can also insert graphics from other applications, and preview your text on-screen before printing it out. Nothing is hidden from you.

We've even added a handy new feature, called the ribbon.

It will make tracking and applying your formats, font, and font sizes a breeze. So your documents will always hit the mark.

Of course, if you do happen to venture into unfamiliar territory, online help can lead you out of the woods. Automatically.

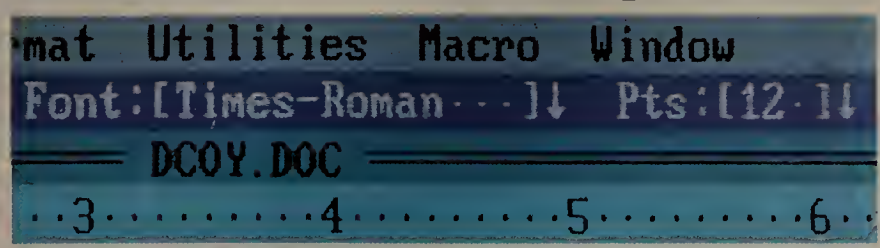


Easily and quickly create the most outstanding documents in your field.

And you can do it all with a point and click.

New Word 5.5 runs swiftly on virtually any PC. And because it features the emerging industry standard interface (CUA), you'll have no trouble transferring your skill to other leading applications.

For more information on just how simple it is to use our new Word, give us a call at (800) 541-1261, Dept. M88.



Our new ribbon lets you tie together anything from fonts to styles to formatting. And all it takes is just a point and click with the mouse.

You'll discover why, in the field of word processing, Microsoft Word 5.5 stands out from all the rest.

Microsoft
Making it all make sense™

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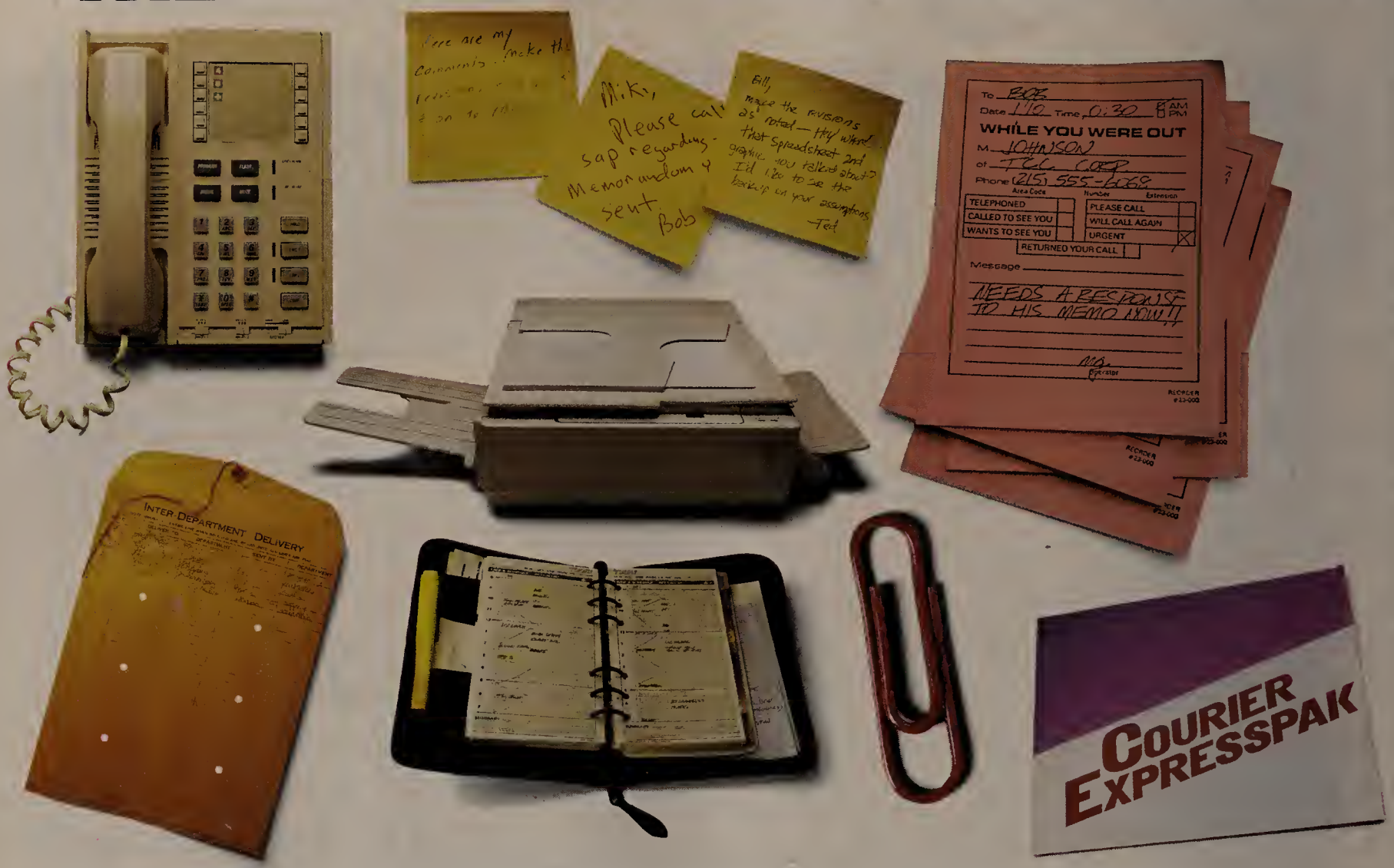
THE REASON SOME EXECUTIVES ARE SO UNPRODUCTIVE IS THAT THEY RELY ON TOOLS LIKE THESE.



It's amazing how many hours of the business day can be frittered away. Trying to line up everybody for a meeting. Getting everyone's feedback on an important document. Playing telephone tag with key people in your organization.

The new Finalsoft Executive™ for Microsoft® Windows™3.0 can change all that. And make your working hours infinitely more productive.

It offers an unsurpassed array of features for both individuals and groups, including:

- Personal and Group Scheduler
- Text Editor
- Dynamic Hypertext
- dBASE III+ compatible database,
- E-Mail
- Integrated Desktop Tools
- Multi-Document Interface
- On-Line Help
- Inter-Applications Communication (DDE)

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FINALSoft

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THE HELP SCREEN

PC World offers answers and advice at every level

Duplicate Paradox field entries in one keystroke, compute the serial date of the last day of the month, demystify CONFIG.SYS's FILES and BUFFERS commands, determine your need for fault-tolerant networking, and more.

Karl Koessel

Duplicating Paradox Entries

Q. *When I work with* Paradox 3.0, *I often need to duplicate the contents of a field from one record to the next. Is there a quick trick that does the job without requiring retyping? I didn't find anything in the manual.*

Alain Hautrive
Brussels, Belgium

A. <Ctrl>-D, known to *Paradox* users as the Ditto key, copies the value from the same field of the previous record. This hot-key combination is listed in the table of *Paradox* special keys and in the index of both the *Paradox* Introduction and User's Guide manuals.

The Last Day of the Month

Q. *My work group uses some highly specialized macros to calculate certain contracts. We've been using an unsupported spreadsheet, and I'm trying to recreate the macros for a more current one, such as* 1-2-3 *or* Quattro Pro. *I've been successful, with the exception of two @ functions that I have been unable to duplicate. The @END_MONTH(argument) function returns the serial date number of the last day of the month in which the date represented by the argument occurs. The @BEG_MONTH(argument) function is similar, returning the serial date number of the first day of the month. The @DYEAR function or converting to a 360-day year won't cut it.*

Akasha Schaefer-Gadbois
Tacoma, Washington

A. While *1-2-3* and *Quattro* can produce the correct serial date numbers for the first and last day of the month from a given day's serial date number, only *Excel* derives them both with simple formulas: **=date(year(a2),month(a2),1)** and **=date(year(a2),month(a2)+1,1)-1**, where *a2* is the address of the cell containing the serial date number in question (see **SCREEN 1**). The latter formula works in *Excel* because the program can correctly calculate a formula that has a month number of 13. For example, =DATE(90,13,1) equals January 1, 1991, in *Excel* but yields an ERR in *1-2-3* and *Quattro*. *Excel* even enables you to turn the formulas into user-defined function macros with names like BEGIN-.MONTH() and END.MONTH() that you can pick from a list box.

For *1-2-3* and *Quattro*, you can use

(continues)

Microsoft Excel

File Edit Formula Format Data Options Macro Window Help

A9 =DATE(YEAR(A2),MONTH(A2)+1,1)-1

SERIAL#.XLS

	A	B	C	D	E	F
1	Serial date		Formatted as m/d/yy			
2	33283	equals	2/14/91			
3						
4	Serial date number of the first day of the month				can be calculated	
5	33270	equals	2/1/91		by a formula:	=DATE(YEAR(A2),MONTH(A2),1)
6	33270	equals	2/1/91		or by a function macro:	=MACRO1.XLM!Beg.month(A2)
7						
8	Serial date number of the last day of the month				can be calculated	
9	33297	equals	2/28/91		by a formula:	=DATE(YEAR(A6),MONTH(A6)+1,1)-1
10	33297	equals	2/28/91		or by a function macro:	=MACRO1.XLM!End.month(A2)
11						
12						

MACRO1.XLM

	A	B
1	Beg.month()	End.month()
2	=ARGUMENT("datenum")	=ARGUMENT("datenum")
3	=DATE(YEAR(datenum),MONTH(datenum),1)	=DATE(YEAR(datenum),MONTH(datenum)+1,1)-1
4	=RETURN(A3)	=RETURN(B3)
5		
6		

Ready

SCREEN 1: In Excel, you can use simple formulas or macro functions to derive the serial date numbers of the first and last days of the month in which a given serial date occurs.

ANTHONY RUSSO

@date(year(a2),month(a2),1) to find the serial date number of the first day of a given month. However, you must use a manually constructed lookup table to find the serial number of the last day of a month. The lookup table method is not as thorough as the *Excel* formula; the lookup function will yield the correct answer only if the answer is within the range of months that you've entered into the table. To prevent erroneous answers derived from out-of-range dates, you'll need to build error trapping into the table.

To build the table, open a blank worksheet and enter the labels **First**, **Date**, **Days**, **Last**, and **Date** in cells A1 through E1. In A2 through E2, enter **0**, **0**, **ERR**, **ERR**, and **ERR**. In cell A3, enter the formula **@date(90,1,1)** (assuming January 1990 is the earliest month you need in the table). Enter **+a3** in cell B3. In cell C3, enter the number of days for the month of the date in A3. In cell D3, enter **+a3+c3-1**. In cell E3, enter **+d3**. Press **/cb3.e3<Enter>b4.e27<Enter>** to copy the formulas in B3..E3. In cell A4, enter **+a3+c3**. Press **/ca4<Enter>a5.a27<Enter>** to copy A4's formula. Place the cell pointer on B3, and press **/rfd4<End><Cursor Down><Enter>** to format the entries in column B as "long International" dates. Place the pointer on E3, and repeat the date-formatting keystokes. Go to C4, type the number of days in February 1990, and press **<Cursor Down>**. Continue entering the appropriate number of days for each month. Finally, enter **ERR** in cells C27, D27, and E27, and name the table MONTH with **\rncmonth<Enter>a1.e27<Enter>**.

To use the table, enter a serial date number (33232, for example) in cell A30 and the formula **@vlookup(a30,month,3)** in cell B30.

CONFIG.SYS's FILES and BUFFERS

Q. *In the DOS CONFIG.SYS file, what is the function of the FILES and BUFFERS commands, and how do I determine what they should be set to?*

Barbara Scace
Philadelphia, Pennsylvania

A. Your CONFIG.SYS file (in the root directory of your PC's boot drive) enables you to modify your system's settings. By default, DOS reserves small portions of memory to use to keep track of and/or manage a number of disk drives, open files, standard devices (such as the screen and keyboard), and disk data buffers. The FILES command lets you increase the maximum number of simultaneously open files, a necessity for modern applications that open multiple data, index, or "internal" utility (such as a spelling checker) files. The BUFFERS command enables you to set the number of disk buffers—DOS's internal disk cache—in order to maximize system performance. Note that the larger the number you specify with either command, the less memory you'll

(continues)

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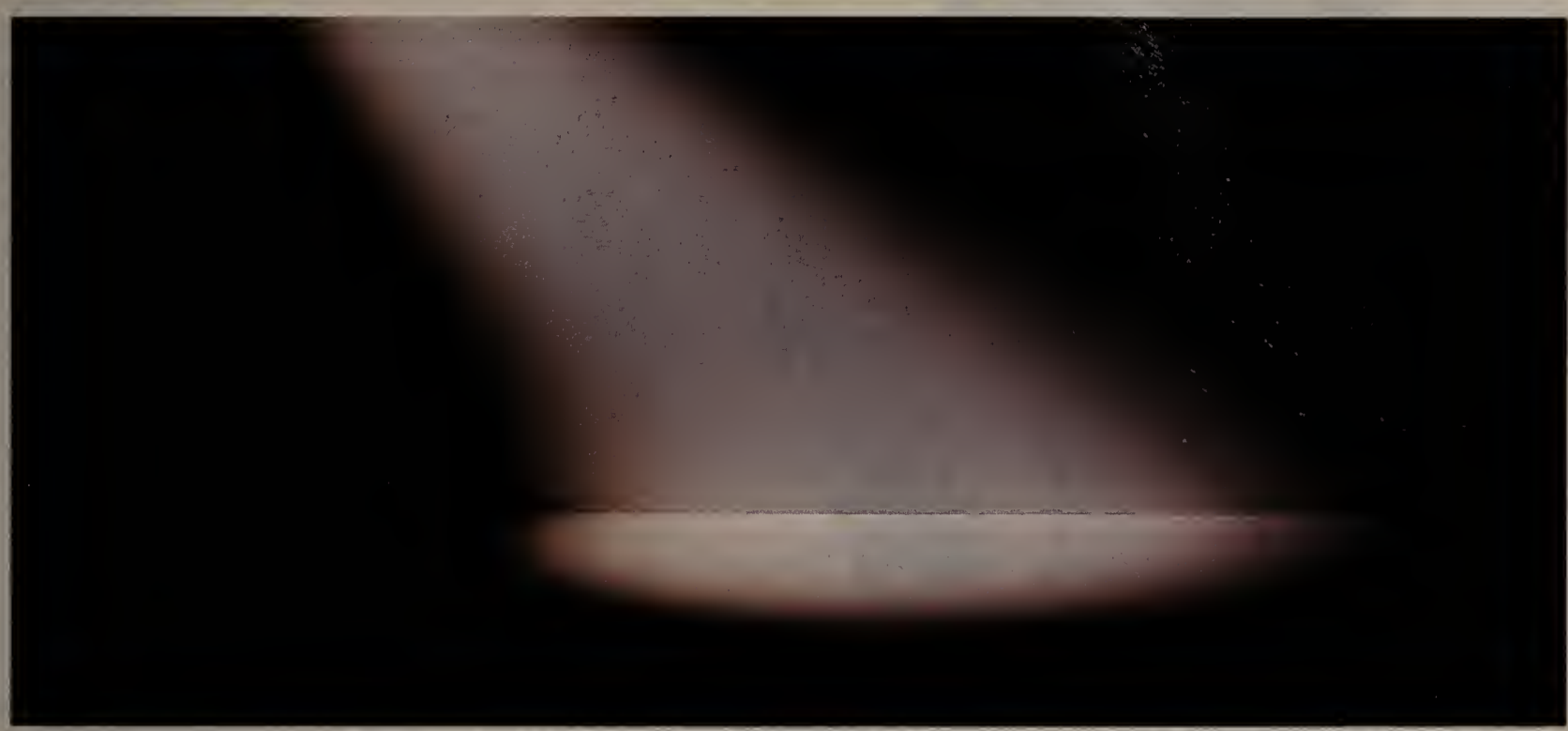

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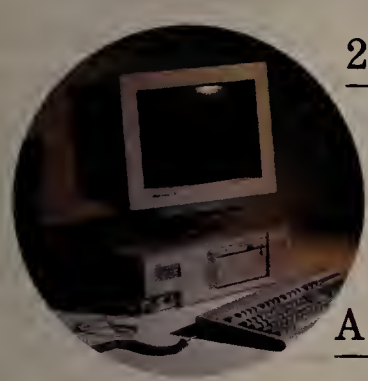

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have left for applications.

The appropriate setting for FILES depends on the applications you use. Most applications either modify CONFIG.SYS for you or inform you during installation of their desired FILES setting. At first, you should set FILES no larger than the largest number suggested by your applications; don't add the applications' suggestions together. Increase the number only if you receive a 'Too many open files' error message.

DOS's internal buffers keep a copy of the sectors most recently read from or written to the disk. Whenever a program wants to read the disk, DOS first searches the disk buffers to see if they already hold the requested data. If so, a disk read can be avoided, boosting performance. Having too many buffers can actually slow down your system; the optimum number depends in part on the characteristics and types of drives, the types of programs you're using, and the number and levels of subdirectories on your hard disk. For example, having a large number of buffers does not improve the performance of programs that primarily access the disk sequentially, but it can dramatically reduce the execution time of programs that access the disk randomly, especially when accessing a file in which the records are small, such as a data base's index file. Increasing the number of buffers can improve disk performance if your hard disk is organized several levels deep. Note also that if you install a disk caching program, you probably should set BUFFERS=1; look in the disk cache's manual for its recommendation.

DISKCOPY in Extended Memory?

Q. *How can I copy high-density disks using extended or expanded memory? Because I have only one high-density floppy drive and the DOS command DISKCOPY uses only conventional memory (640K), I have to swap disks many times to copy one disk.*

Frank C. Yang
Elmhurst, New York

(continues)

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A. Until someone writes a DISKCOPY command that uses extended or expanded memory, you'll have to keep doing the floppy shuffle. However, you usually don't need the exact, sector-by-sector duplication that DISKCOPY produces, but rather a disk containing simple copies of the original files. In such cases, the *Disk Copy diskette* command in *Windows 3.0*'s File Manager can copy a high-density disk in a single pass, provided, of course, that you have a few megabytes of extended RAM and are not concurrently using much memory running other programs.

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POWER TIP NO. 160

Getting the Right Record With dBASE III Plus

Set Relation, which links two data bases by a common key, is one of the most powerful *dBASE III Plus* commands. However, Set Relation has one undocumented quirk that can produce undesirable results. When *dBASE* searches the child data base for the first key that matches the parent data base's key, the matching record may be a deleted one—even if Set Deleted is on. To avoid this problem, ensure that the child data base contains no deleted records before you create the relation by issuing a Pack command.

Roger W. Sauer
Fairfield, California

NETWORK Q&A

Fault Tolerance Helps Prevent Data Loss and Downtime

Keith Nickerson

Q. *I am planning to purchase a network operating system for our business, but I am slightly confused about the fault-tolerance issue. My question really has two parts: First, what exactly is fault tolerance, and second, how do I decide if it's right for us?*

Robert A. Franklin
Detroit, Michigan

A. Fault tolerance, put very simply, is the ability of a system to prevent data loss and network downtime. The data on your network is clearly valuable, but the cost of network downtime is easily underestimated. According to a study by Infonetics, Inc., of Santa Clara, California, the average annual lost productivity resulting from network failures is valued at almost $3.5 million per corporation, and lost productivity for some companies is over $100 million annually.

At the most fundamental level, fault tolerance is achieved (at least partially) through the use of tape backup systems and uninterruptible power supplies (UPS's). Most network managers realize the importance of good backup and archiving strategies and of devices that will keep the network running in case of power failure or power surges. No network should lack these two elements of fault tolerance.

Disk Mirroring and Duplexing

Advanced, and more expensive, network operating systems, such as Novell's NetWare SFT (System Fault Tolerance) and NetWare 386, offer additional levels of fault tolerance based on hardware redundancy. Disk mirroring, for example, requires two disk drives. All data written to the primary drive is also written to the secondary drive, thereby providing two copies of all the information stored on the network. If the primary drive malfunctions while disk mirroring is active, the secondary drive will simply take over the operations that the primary drive was performing.

Disk duplexing takes this hardware redundancy a step further, requiring that the entire disk channel be replicated. A disk channel is defined to be the disk drive, the power supply, and the disk controller card or host interface, such as Novell's Disk Controller Board (DCB). In this scenario, if any component of one disk channel fails, the other disk channel will take over without any loss of data.

Disk duplexing also provides a performance bonus by enabling "split seeks." When a READ operation is requested and disk duplexing is in effect, the drive that is less busy will receive the request. If both drives are equally available, the drive with its heads closest to the data will receive the request. In addition, duplexed disk channels can service distinct sets of READ requests; that is, READ requests are split between the two disks' channels. As a result, disk duplexing doubles the throughput of the disk drive system. Since the majority of disk accesses are READ requests, overall file server performance is greatly improved.

Is SFT for You?

Clearly, there is significant cost involved in having twice the disk subsystem hardware on your LAN. A reliable, medium-sized (300MB) disk subsystem, for example, can cost over $6000. This expense is the major drawback to SFT networks. In addition, Novell's NetWare SFT lists for about $2000 more than its Advanced NetWare. If you are on a tight budget, perhaps SFT is not for you. A reliable UPS and a good backup strategy might yield a more favorable cost/benefit ratio.

Also consider whether the work done on your LAN merits the level of protection provided by SFT networks. For example, if you use your network mostly for word processing and personal productivity, it's probably not as "mission critical" as a network that is used to monitor real-time data from an oil field pipeline and control gauge settings and valve adjustments. The question here is, if half a day of downtime is only an inconvenience, can you really justify the added expense of an SFT system?

So the bottom line is: An SFT network is for you if you can afford it, and if your data and applications are critical enough to warrant the expense.

Keith Nickerson is the editor of NetWare Advisor *and a member of the publishing team of Business Systems Group, a Houston-based network consulting firm.*

POWER TIP NO. 161

Applications Load Files Automatically

Many applications allow you to load a program and open a file with one command. If you want to load *WordPerfect 5.1* and open TEST.DOC from the directory C:\TEMP, for example, type `wp c:\temp\test`. The application loads, and you can get right to work. With some programs, this procedure not only gets you into your work file quicker but also cuts the loading time for your application dramatically.

Ryan M. Allen
Naples, Florida

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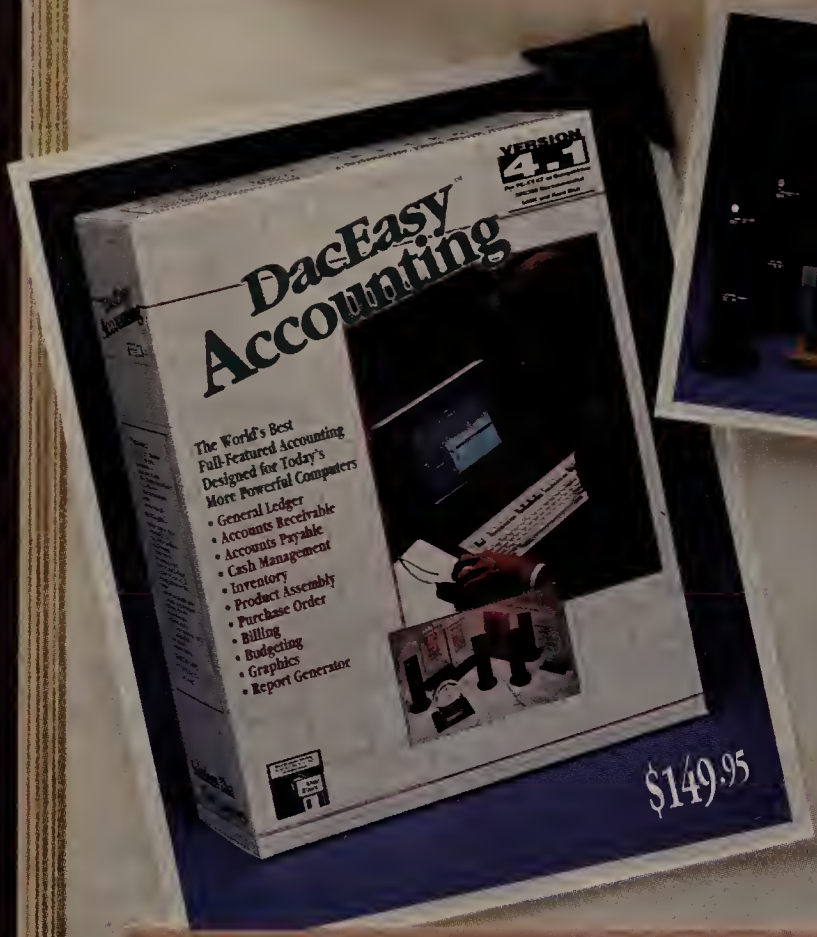

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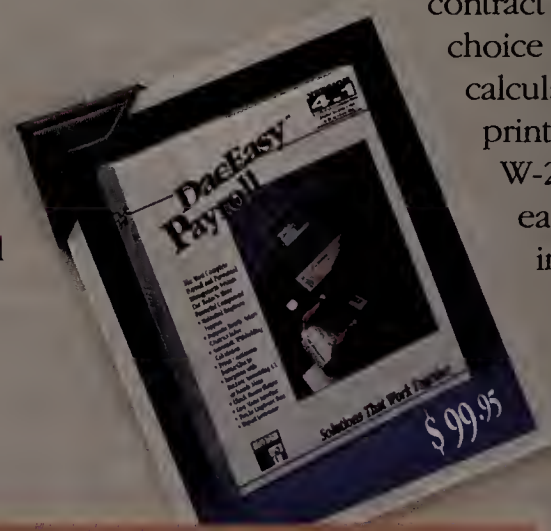

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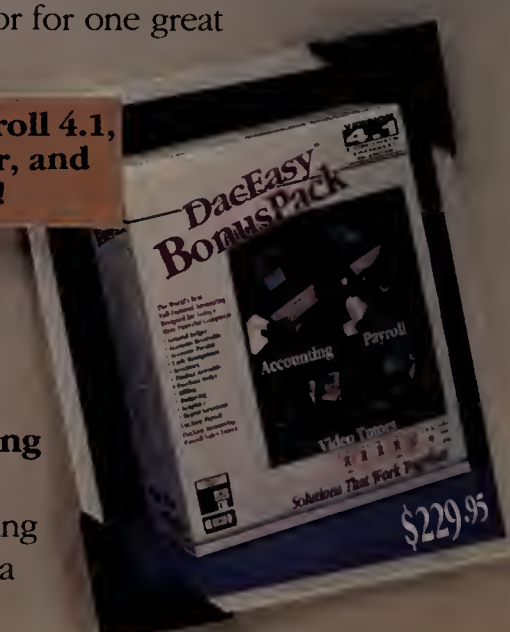

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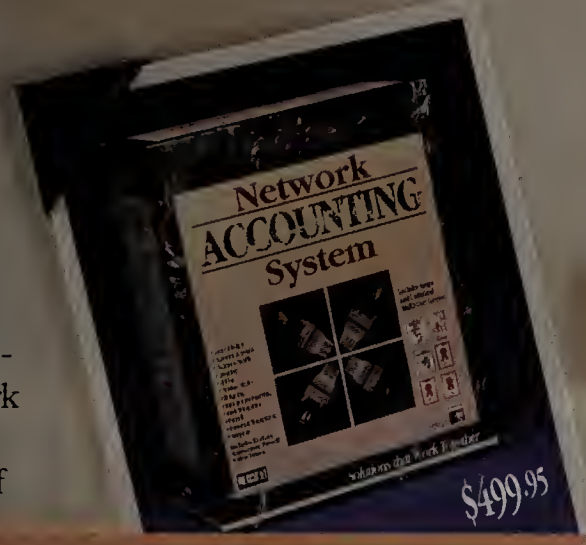

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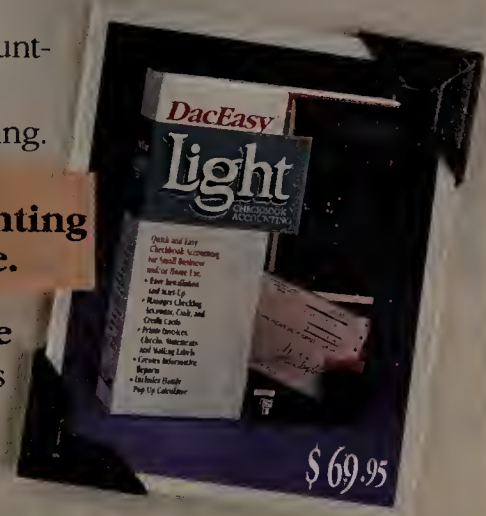

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PC MAGAZINE EDITORS' CHOICE
October 30, 1990
Software Carousel, Version 4.0

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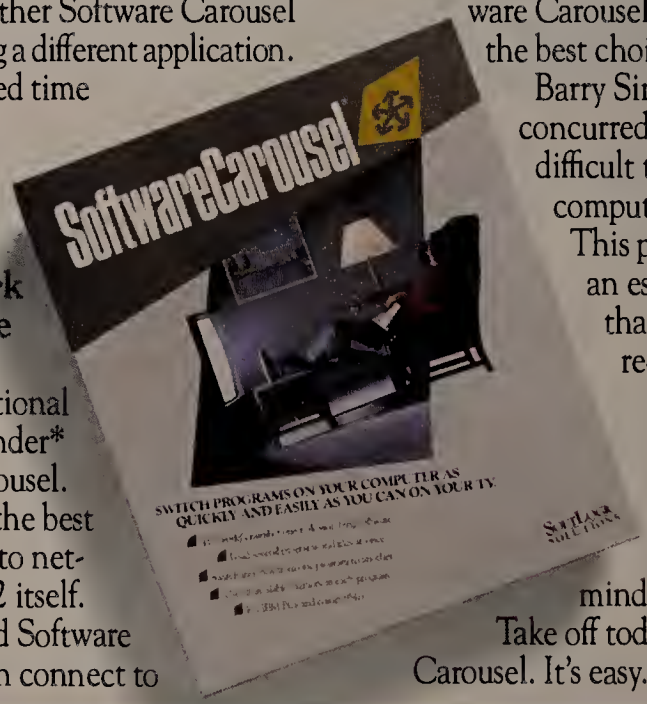
And OLÉ works with all kinds of connection software. Including IBM, Attachmate, and others. Without changes to your hardware or software.

Even the experts agree.

Garry Ray, writing for PC Week, said, "Of these alternative operating environments (OS/2, DesqView and Software Carousel), Carousel may be the best choice of the day."

Barry Simon of PC Magazine concurred with, "...I find it difficult to imagine using my computer without Carousel. This package has become an essential tool and one that I strongly recommend."

So if you really want the major benefits of Windows and OS/2, don't get grounded with high cost and mind-bending complexity. Take off today with Software Carousel. It's easy. And it's just $89.95.



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Circle 23 on reader service card

CONSUMER WATCH

Advice and information for the computer consumer

It shouldn't take months and a small fortune to repair an old PC. A little investigative work now can save you hours of frustration when your system breaks down.

Roberta Furger

ANTHONY RUSSO

Help for an Ailing Workhorse

Despite all the interest in today's faster, more powerful systems, hundreds of thousands of people tap away each day on PCs that have long since been discontinued by their manufacturers. Leading Edge and Kaypro, for example, together have an installed base of well over one million users—most of them with systems that dropped out of the market years ago.

In an ideal world, if your old system petered out you'd just pack it up and buy a newer, more powerful (and better supported) PC. But in the real world, you may be stuck for better or worse with an early model.

Getting a system repaired can be a hassle, regardless of the brand or vintage. But the problem becomes even more complicated when you're dealing with an early-model PC.

Chances are the original dealer closed its doors long ago. Current dealers are generally unwilling or unable to repair older units, since there's not a lot of profit involved. You may be able to get help from the manufacturer—provided, of course, that the company's still in business.

So what *should* you do when Old Faithful breaks down? Knowing where to go is half the battle.

Going to the Source

If the dealer who sold you the PC is no longer in business, your first call should be to the manufacturer. Even when the product has been discontinued, the supplier has a vested interest in continuing to support its installed base. This support can include anything from simply recommending authorized repair centers to actually repairing the unit. Many of the larger firms continue to supply parts for five to seven years beyond the last date of manufacture.

But parts inventory (along with other value-added services) is frequently one of the first "extras" to fall by the wayside when a company runs into financial trouble. That's what the new Leading Edge management found when they took over the company in January 1990. Current chief executive Al Agbay says there was a 58-day turnaround on repairs and essentially no parts inventory. "There was just a pile of junk that technicians had to rummage through to find replacement parts."

The company has since recertified all its dealers and authorized repair centers, instituted a 24-hour turnaround on parts, and signed a service agreement with General Electric for both on-site and depot service.

Mining the Local Resources

Not every manufacturer has seen the light, however. It's not unusual, even in healthy companies, to get the runaround from technical support to customer service and back again. If you strike out with the manufacturer, your best bet is to talk to local users.

Members of your nearest user group (see *Consumer Watch*, August 1990) can recommend repair shops and local and national mail-order firms that specialize in hard-to-find clone parts. Often, user groups also can put you in contact with other owners of the same brand of system. An expert in the group may even be available to diagnose what's ailing your PC and help you decide on the best course of action.

Local user groups may in fact be your only resource when it comes to finding a reputable service center, says John McHugh, a systems integrator in New Hampshire. "Going through the phone book won't help," he says. "You have to look in the nooks and crannies."

Minimizing the Wait

Regional service centers and local repair shops rarely turn away business, so if you look hard enough you're bound to find someone willing to fix even the most obscure brand. You may, however, find yourself waiting weeks or months while technicians search for the right part.

One way to minimize your wait—and the repair costs—is to go with a repair shop that does all its own work. In particular, look for one that's staffed by electrical engineers (a rarity these days). "Most [repair centers] simply verify the problem and send it out to someone to fix," says Bill Claff, technology director for the Boston Computer

(continues)

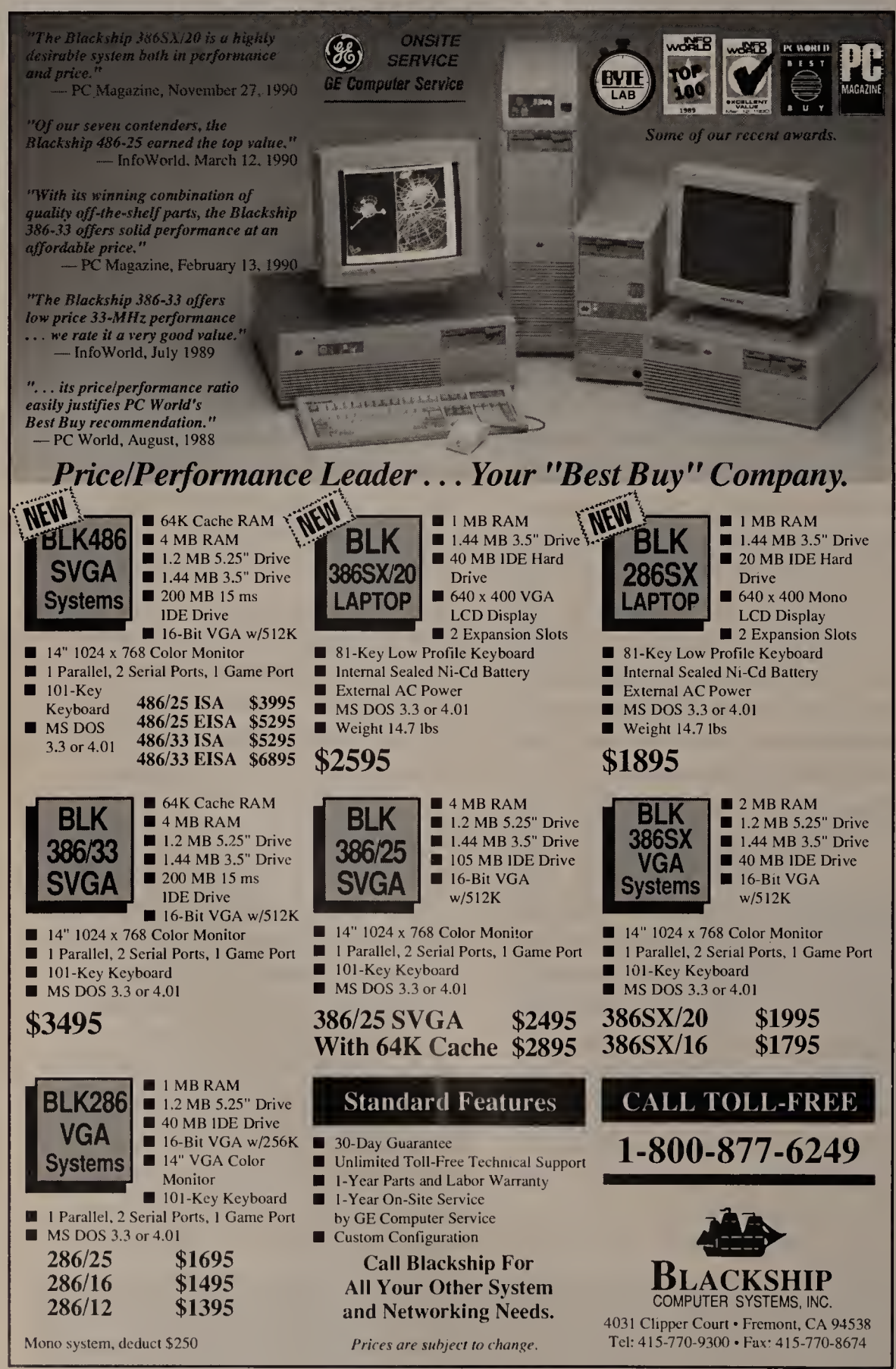
Society's IBM PC Users Group. That generally results in delays and added expense.

Most repair centers charge around $50 per hour for diagnosing and repairing PC hardware problems. Expect to pay a little more if you live in a larger metropolitan area, where hourly rates can run as high as $70. Always get an estimate in advance, and ask about minimum charges. Some repair centers may require you to pay for a minimum of two or three hours' work—even if your system is fixed in less time.

To Fix or Not to Fix

Not every problem is worth fixing. If it will cost you several hundred dollars to replace a major component, or if you find yourself constantly making minor repairs, you're better off cutting your losses and buying a new system.

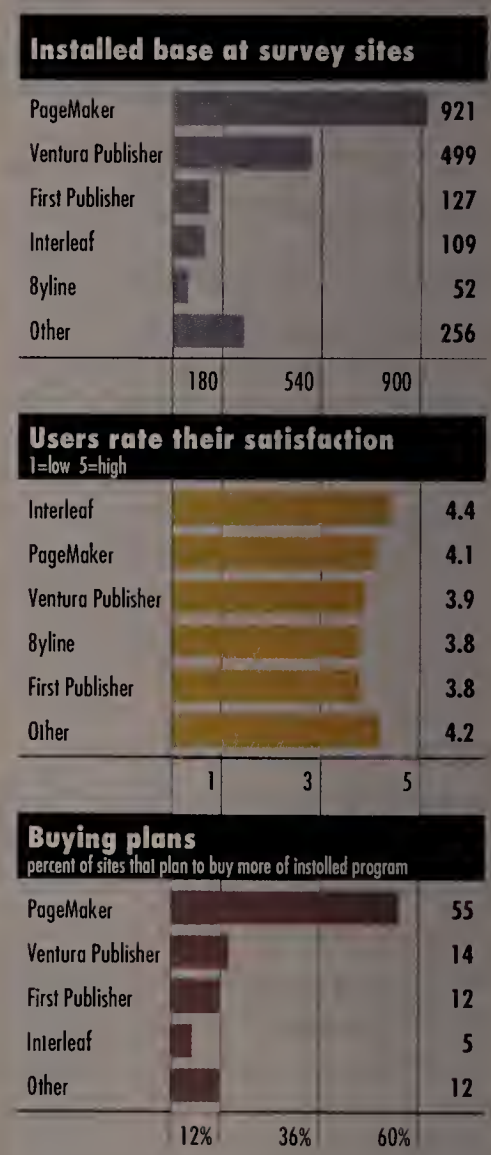
Keyboards and floppy drives are often the components that fail first. Fortunately, they're also relatively inexpen- *(continues)*



Circle 1 on reader service card

RATE YOUR SATISFACTION: Desktop Publishing Software

Aldus's *PageMaker*, which virtually defined desktop publishing, continues to lead the category easily. Although several low-end desktop publishing packages have been introduced, the two powerhouses—*PageMaker* and *Ventura Publisher*—still enjoy the largest installed base. Although neither product tops the user satisfaction ratings, they're first among the plan-to-buy statistics.



Source: International Data Corp. From a survey of 200 organizations, each with at least 50 PCs.

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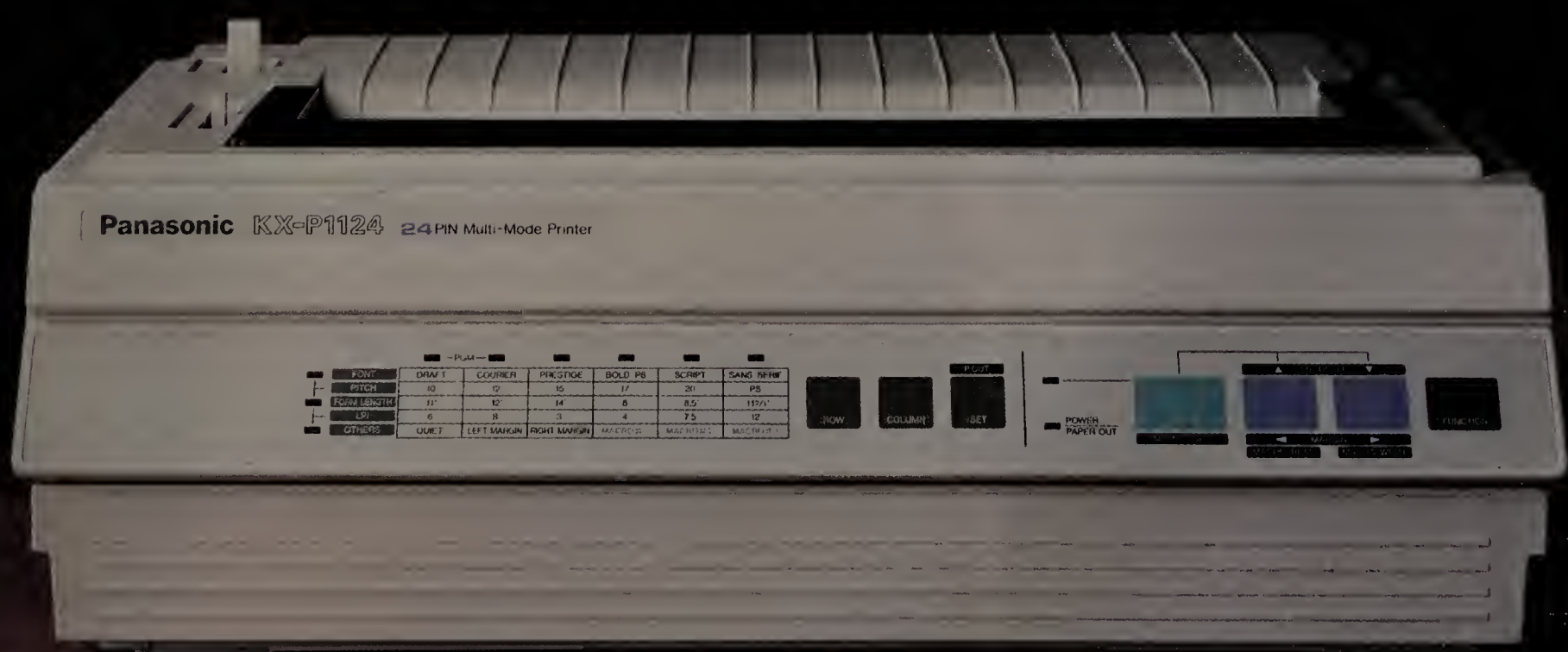

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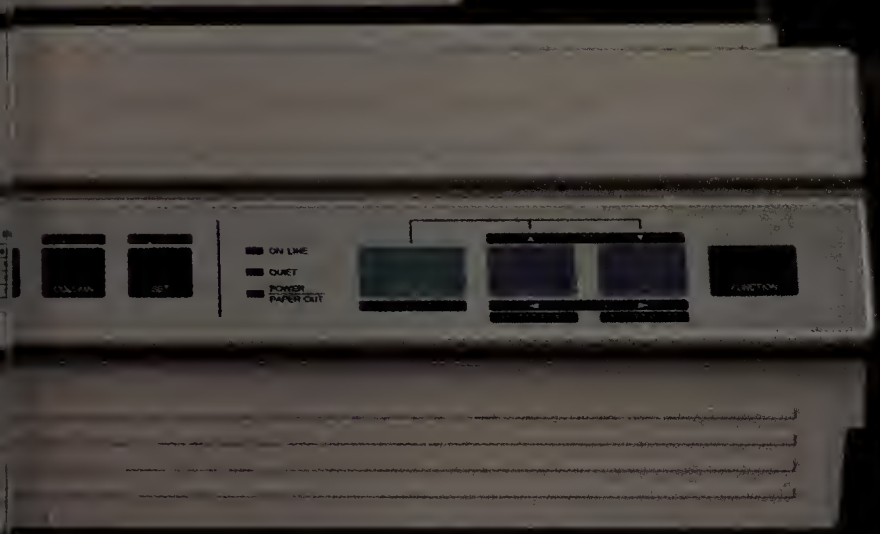

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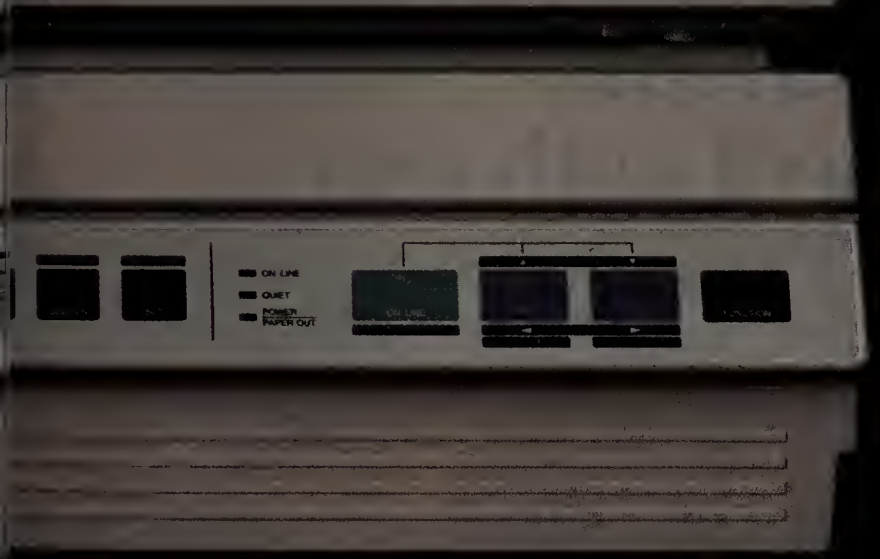

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sive to replace. The same is true of add-in boards such as graphics adapters, which generally require nothing more than plugging in a new board to get back in business.

Some component failures—such as the hard disk controller—give you the opportunity to upgrade your system for a relatively low price. A new controller and a low-level format of your hard disk, for example, can often halve disk access time, says Claff, and "may only cost around $120."

Hard drives and power supplies are more expensive, but replacement may still cost less than buying a new system. Failure of a major component like the motherboard, on the other hand, means you should start pricing new units.

Ultimately, whether you fix or simply replace your system depends on how satisfied you are with its performance. Many XTs, for example, are perfectly adequate for word processing. But if you find yourself drumming your fingers while the system slowly recalculates your spreadsheet, it's time to go shopping for a 1991 model.

Plan Ahead

The biggest mistake owners of early models make is to wait until the PC breaks before finding out how to get it repaired. By then it's too late. You can spend weeks figuring how to fix it. A few calls now can save you a lot of grief.

SHOP TALK

Prodigy Disconnects Angry Protesters

Long accused of censoring users on its public bulletin boards, Prodigy has gone a step further in mandating what its users can and can't discuss on line. As many as a dozen users were kicked off the system recently after protesting the service's imposition of fees for private E-mail messages.

The company also prohibited further discussion of the new fees on any of its public bulletin boards.

The controversy centers around new E-mail fees scheduled to go into effect January 1. Each household will get 30 free electronic-mail messages per month. Additional messages will cost 25 cents per recipient.

Most opposition to the charges has come from Prodigy users involved in so-called private E-mail groups—discussion and support groups formed by people of like interests. Many of the groups were formed after members' messages were rejected for the public BBS. These users say Prodigy encouraged them "to take their discussion private," and that they are now being penalized for doing so.

But Prodigy spokesperson Brian Ek insists "that's flat-out untrue." Ek says the charges were imposed because private E-mail messages got out of hand, pushing up costs for the financially ailing service. "Prodigy is still not a mon-

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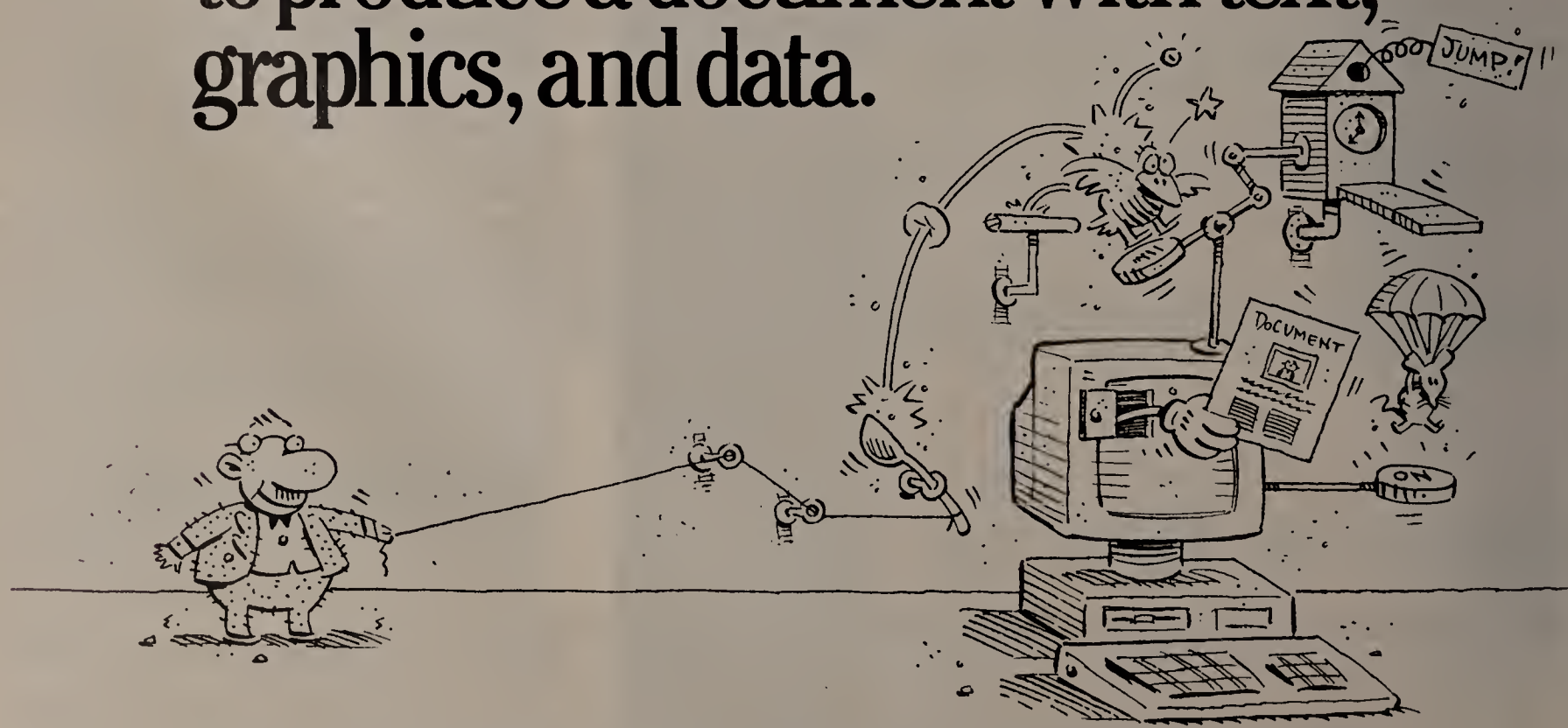

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ey-making operation. Clearly that's our first priority," he says.

Perhaps. But it's hard to imagine a situation in which the prohibition of discussion and the termination of member services is warranted.

In the end, Prodigy's heavy-handed methods are likely to cost it some loyal subscribers. *Consumer Watch* has already heard from several users (and former users) who plan to look elsewhere for on-line services.

Express Micro Closes Shop

After several months of failing to respond to either customer or *Consumer Watch* inquiries, Express Micro Mart, a mail-order firm in Bloomfield, Michigan, appears to have gone out of business. Its 800 sales number and customer service lines have been disconnected, and its only working number is answered by a machine.

We have received numerous letters from EMM customers, but most of the complaints are likely to remain unresolved. If you have paid for, but not received, merchandise from EMM or have a related complaint with the company, you should contact both the Better Business Bureau in Detroit (313/644-9136) and the Detroit Postal Inspector's Office (313/226-8184).

A word of caution: Most mail-order firms operate on the narrowest of margins. Their financial position can be particularly tenuous in rough economic times. For your own protection, then, check with the local Better Business Bureau and the postal inspector's office before doing business with a mail-order firm. And always pay with a credit card, never with a check or money order.

Something's Missing

I recently purchased a new computer, one that leaves my old-style Turbo-88 machine in the dust. Included with the machine were both DOS and *Windows 3.0*. Well, sort of.

After unpacking and setting up the machine, I read a review article on *Windows 3.0* in a computer magazine that indicated that integral to the new version was a program called *ToolBook* for constructing *Windows* applications. One such application, DayBook, was also included. Try as I might, I could find no such program on my disks.

I called the computer manufacturer, Gateway 2000, and asked about the missing program. At first I was assured that the *Windows* package included with the computer was complete and that no programs were omitted. When I pursued the point, I finally reached a salesman who confirmed that *ToolBook* was not included with the *Windows* package bundled with the Gateway computers. He added that this was a shock to him, since he apparently had *ToolBook* on his own computer and was under the impression that the *Windows* package shipped with the Gateway sys-

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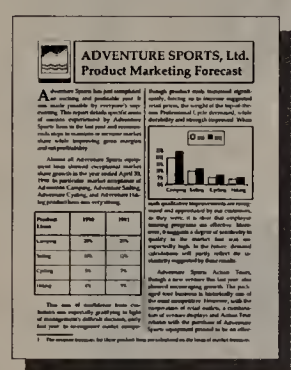

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Circle 199 on reader service card

tems was the same as the one he used.

A bit more research turned up the information that this omission may not be unique to Gateway 2000. Before buying a computer system with *Windows* bundled, just ask what the package contains. You may be surprised.

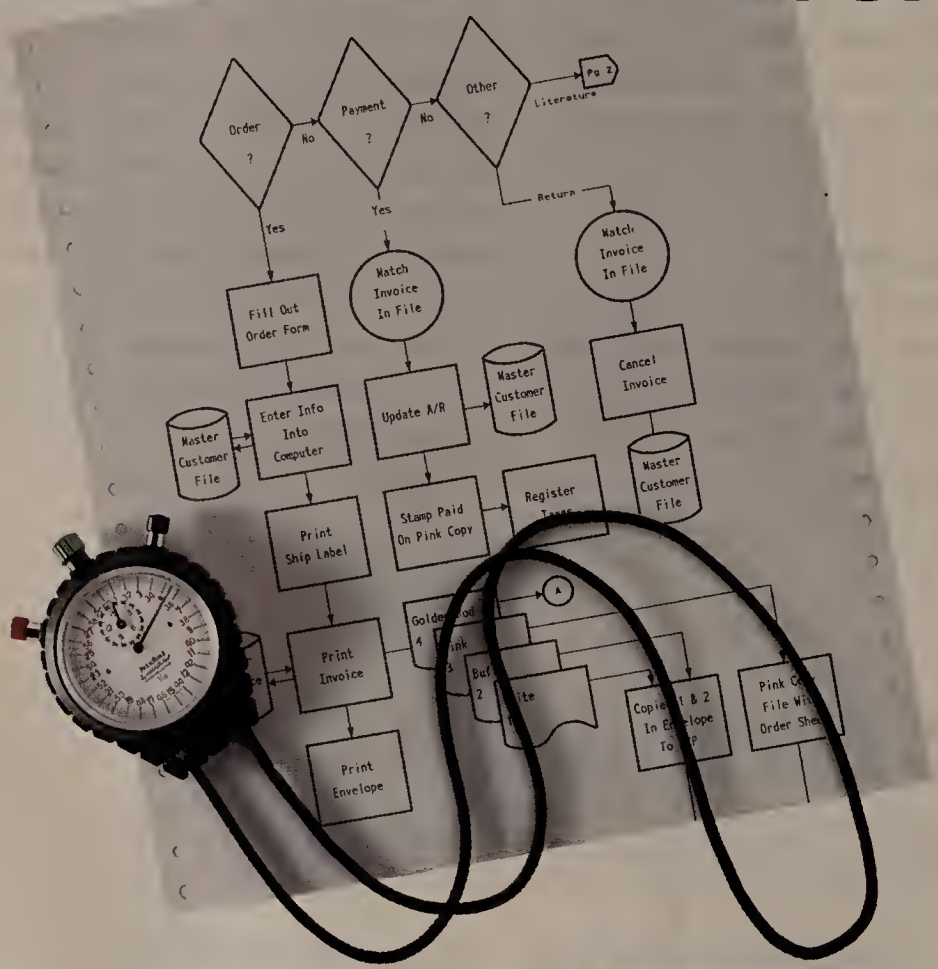
Marc O. Leavey, M.D.
Baltimore, Maryland

Editor's note: Dr. Leavey is right—the Windows 3.0 *bundle offered by most hardware manufacturers does not include* ToolBook, *a product put out by Asymetrix. DayBook, a personal organizer written with* ToolBook, *was included with early copies of* Windows 3.0 *sold separately at retail, but that combination was never offered to PC suppliers, says Gateway spokesperson Todd Osborne.*

Companies such as Zenith Data Systems, which bundles both Windows 3.0 *and* ToolBook *with its 386 systems, had made separate arrangements with Asymetrix, notes Zenith spokesperson Glen Nelson.*

Some PC makers say the confusion about what comes with Windows *arose because Microsoft's early advertisements of* Windows 3.0 *may have given the impression that* ToolBook *was part of it.*

BY HAND. OR BY NOON.



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What 30-Day Guarantee?

Last June *Consumer Watch* ran an item about Steve Dobronyi, who took Resource Analysis International up on its 30-day guarantee and returned its spreadsheet compiler when he found it wasn't what his firm was looking for. The company initially refused to refund his money, but it agreed to do so after *Consumer Watch* intervened.

Mr. Dobronyi says, however, that no refund has arrived, and RAI does not return his calls. *Consumer Watch* has since received a letter from another RAI customer who likewise encountered trouble when he tried to take the company up on its 30-day guarantee.

Money-back guarantees are powerful sales tools. They provide customers with a degree of insurance should a mail-order product prove inadequate or fail to work as advertised. Unfortunately, some companies don't feel compelled to honor the claims made in their advertisements. When that happens, file a report with the local Better Business Bureau. It may not help you, but it could keep others from meeting a similar fate.

Think you've gotten a raw deal? Send the details to Consumer Watch, *PC World, 501 Second St. #600, San Francisco, CA 94107; MCI Mail PC World/179-3813, CompuServe 74055,412, or via facsimile, 415/442-1891. We'll investigate your complaint. Letters with the broadest interest will be published.*

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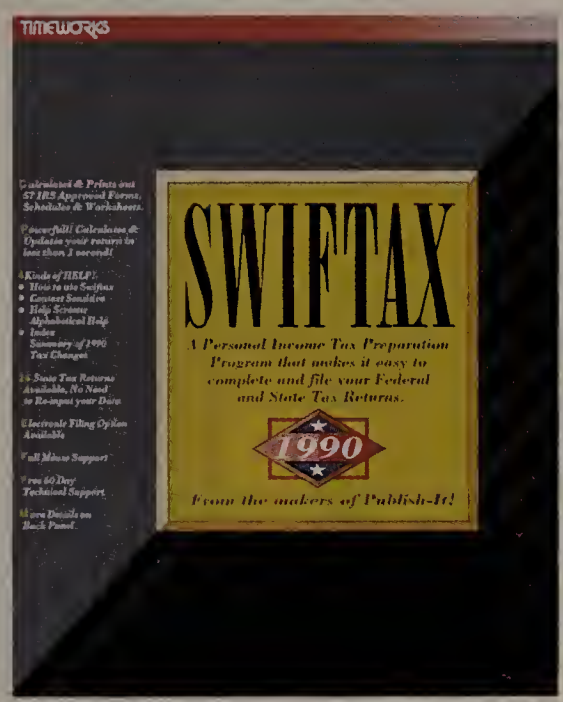

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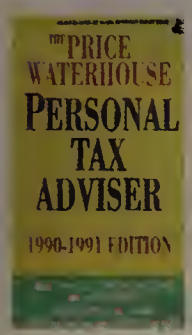

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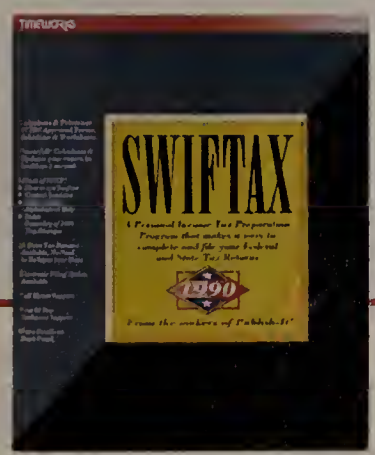

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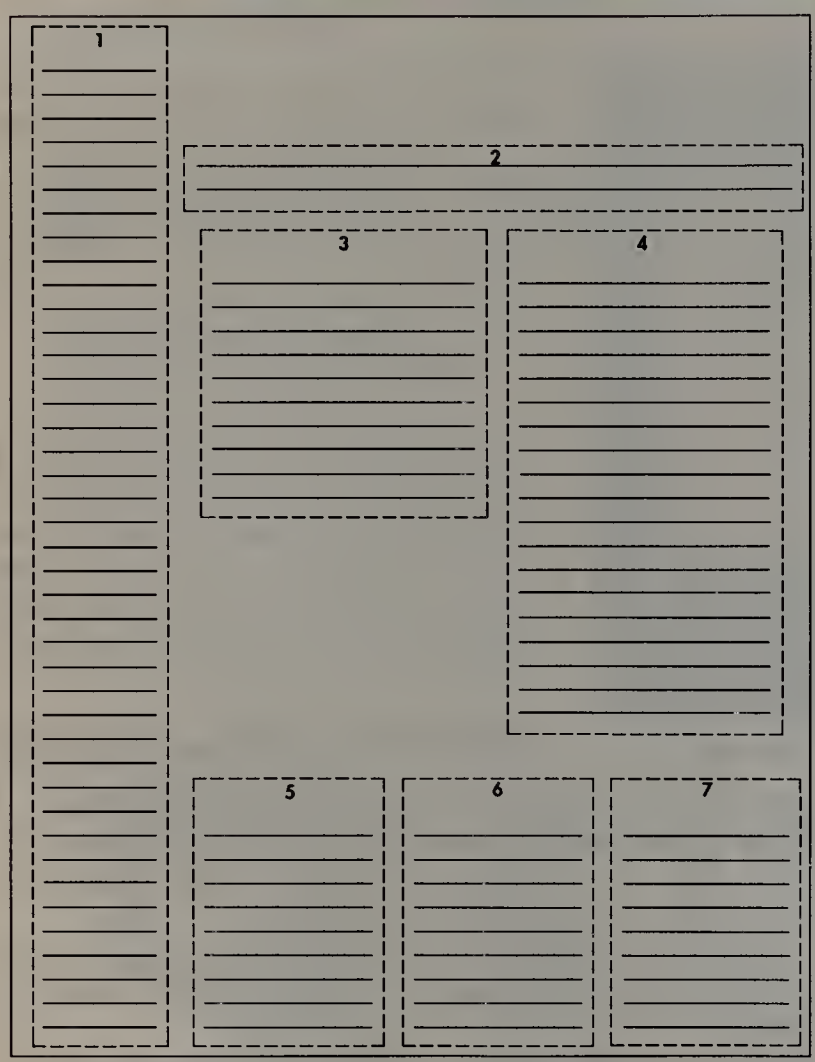

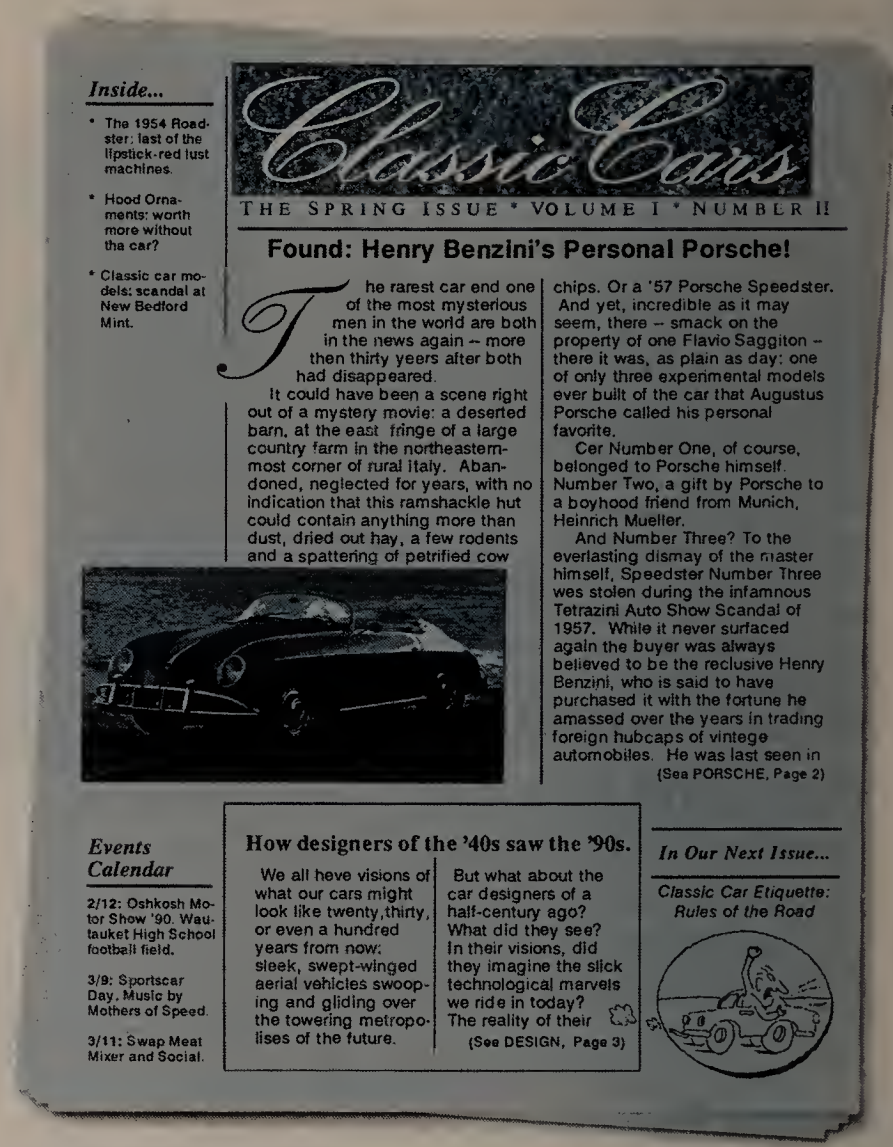

Inside...

- The 1954 Roadster: last of the lipstick-red lust machines.
- Hood Ornaments: worth more without the car?
- Classic car models: scandal at New Bedford Mint.

Classic Cars

THE SPRING ISSUE * VOLUME I * NUMBER II

Found: Henry Benzini's Personal Porsche!

The rarest car end one of the most mysterious men in the world are both in the news again -- more then thirty yeers after both had disappeared.

It could have been a scene right out of a mystery movie: a deserted barn, at the east fringe of a large country farm in the northeasternmost corner of rural Italy. Abandoned, neglected for years, with no indication that this ramshackle hut could contain anything more than dust, dried out hay, a few rodents and a spattering of petrified cow chips. Or a '57 Porsche Speedster. And yet, incredible as it may seem, there -- smack on the property of one Flavio Saggiton -- there it was, as plain as day: one of only three experimental models ever built of the car that Augustus Porsche called his personal favorite.

Cer Number One, of course, belonged to Porsche himself. Number Two, a gift by Porsche to a boyhood friend from Munich, Heinrich Mueller.

And Number Three? To the everlasting dismay of the master himself, Speedster Number Three wes stolen during the infamnous Tetrazini Auto Show Scandal of 1957. While it never surfaced again the buyer was always believed to be the reclusive Henry Benzini, who is said to have purchased it with the fortune he amassed over the years in trading foreign hubcaps of vintege automobiles. He was last seen in

(See PORSCHE, Page 2)

Events Calendar

2/12: Oshkosh Motor Show '90. Wautauket High School football field.

3/9: Sportscar Day. Music by Mothers of Speed.

3/11: Swap Meat Mixer and Social.

How designers of the '40s saw the '90s.

We all heve visions of what our cars might look like twenty, thirty, or even a hundred years from now: sleek, swept-winged aerial vehicles swooping and gliding over the towering metropolises of the future.

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(See DESIGN, Page 3)

In Our Next Issue...

Classic Car Etiquette: Rules of the Road

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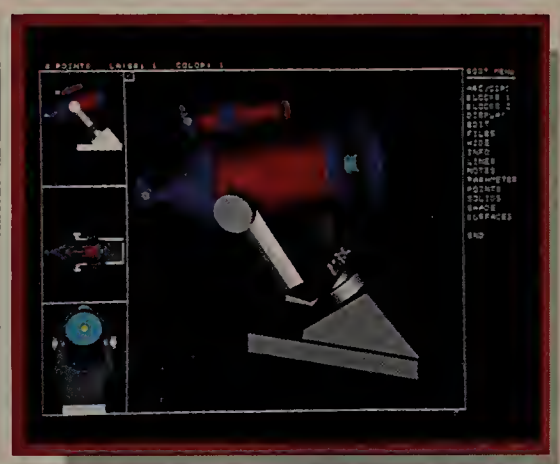

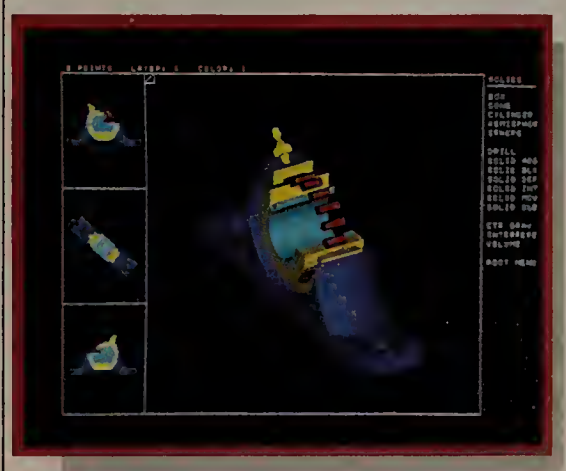

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Circle 77 on reader service card

Edited by ERIC BENDER

IBM, Tandy Back Industry Standard

Windows Dives Into Multimedia

PCs Gaining Good Audio, CD ROM Drives This Summer

Multimedia packages like the National Geographic's Mammals Encyclopedia will spread faster with standard multimedia PCs.

JOSEPH H BAILEY, NATIONAL GEOGRAPHIC SOCIETY

High-quality images, audio, animation, and even full-motion video will enrich the information on your PC and make it more accessible. The scenarios are endless: Annotate your spreadsheet with voice comments, create dazzling animations for business presentations, or pop up a video tutorial when you need online help. "Audio and video can make *any* application better," says Michael Braun, head of IBM's multimedia group.

Of course, this all remains theory until the required technologies are integrated into standard, reasonably priced PCs. That's precisely the problem Microsoft's new *Windows* multimedia architecture attacks. This will be the first consistent, widely supported environment for PC multimedia applications. Vendors will offer suitable multimedia hardware by midyear, with dozens of software titles appearing by year-end.

The minimum platform will be a *Windows*-capable 286 or better with 2MB of memory, VGA, a 30MB drive, a CD ROM drive, a MIDI music interface, speakers, and an audio suite that packs voice digitization, a music synthesizer, and CD-quality playback. Tandy and others expect to sell such PCs for below $3000, and upgrade kits will cost less than $1000. (Many expect CD ROM drives to retail for $200 a year from now.)

Business First?

Still, the cost of entry means that initially only businesses and schools are likely to spring for multimedia PCs. While developers are busily crafting home education, reference, and entertainment packages, "we don't see people paying $3000 to buy the multimedia version of a Mother Goose story," says Howard Elias, Radio Shack's vice president for computer merchandising. As prices fall, the new machines will move toward the home.

Tandy, IBM, AT&T, NEC, Zenith, and others are betting that their hardware and the *Windows* architectural standards will jump-start this category. Others insist that the price point demands serious business software first. "This target seems a little too low-end," says Compaq North America president Michael Swavely.

However, key hardware components already are migrating toward vanilla PCs. IBM's XGA graphics adapter bows to multimedia with its higher resolution, vastly greater numbers of colors, and faster performance. PCs will begin to follow the lead of workstations such as Sun Microsystems' Sparcstation that incorporate audio processors—and CD ROM players, which Sun uses to deliver all software.

Silicon makers are busily stamping out chips for compressing and decompressing still images, video, and audio. Among these, an Intel/IBM Digital Video Interactive chip set will let PC makers deliver full-motion video by year-end for $1000, excluding storage. The huge storage demands posed by multimedia files will be met by peripherals like IBM's upcoming read/write optical drive, which stores 125MB on a removable 3½-inch disk.

Multimedia won't take off immediately; "it's a bit of a paradigm shift," says Rob Glaser, head of Microsoft's multimedia systems group. But William Spaller, IBM's director of multimedia development, adds that "soon people will say, 'I'm going to buy a PC, and it had better be able to do multimedia.'" —*E. B.*

CHRIS MORRIS

The Windows multimedia architecture calls for embellishing a standard PC with an audio suite and a CD ROM player. Over time, multimedia PCs will add powerful circuitry for combining audio, still images, and full-motion video, plus high-capacity erasable-optical drives.

Winner Declared in Font Wars: Users

Rivalry Sparks Cheaper, Faster, Better Laser Printers

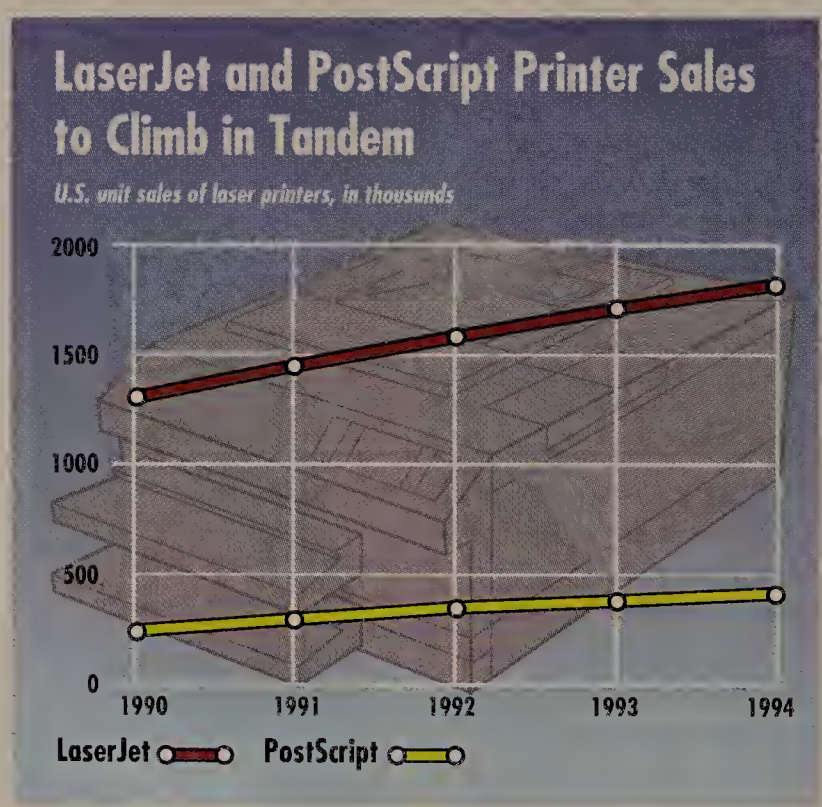
Competition works—ask anyone buying a laser printer this year.

In mid-1989, Adobe's PostScript was your only real choice for a page-description language (PDL) and scalable-font generator that let you spin fancy graphics from your laser printer. Today's alternatives include PostScript-compatible offerings, the Microsoft/Apple TrueImage/TrueType combination, and even Hewlett-Packard's PCL 5—which brings many PostScript-like capabilities to the LaserJet III and work-alikes. And Adobe's PostScript Level 2 is waiting in the wings.

Confusion will reign over this market for the foreseeable future, says Marc Boer, senior analyst with BIS CAP International in Norwell, Massachusetts. But customers now enjoy far more choices—including new on-the-fly font-scaling packages that eliminate the need to store numerous large bit maps (and even let you download some fonts to older printers that lack PDL capability). By summer, the options should be even faster, more convenient, and cheaper.

Additionally, users face fewer investment risks than in the average PC standards war, because the combatants generally want to enhance rather than overturn the PostScript standard. For instance, Hewlett-Packard, which is more interested in selling printers than PDL interpreters, is marketing a $695 Adobe PostScript upgrade cartridge for its LaserJets.

Even Microsoft describes its TrueImage/TrueType alternative as a "superset of PostScript." TrueImage product manager Dan Steele does insist that the interpreter will be several times faster than PostScript Level I. He adds that TrueImage printers like the new Microtek TrueLaser can generate both TrueType and PostScript fonts but are turbocharged for *Windows*.



BIS CAP International expects the market shares of HP LaserJets and compatible printers and more expensive PostScript printers to remain relatively constant through 1994, with each type of printer enjoying healthy sales growth rates of more than 15 percent annually.

CHRIS MORRIS

Free-Fall for Printer Prices

For years the prime desktop device for PostScript printing was Apple's 8-ppm LaserWriter IINTX. A month before the September 1989 Microsoft/Apple announcement, it carried a $7000 price tag, while the cheapest PostScript laser was a no-name brand for $4200.

Apple now sells the 4-ppm Personal LaserWriter NT for $3299. Other vendors promote 4- to 6-ppm personal lasers like the Epson EPL-7500, the Texas Instruments MicroLaser, and the QMS PS 410 with better prices, more features, or both. The best example may be the NEC Silentwriter2 Model 90, a 6-ppm printer offering both PCL 4 emulation and Adobe PostScript for only $2495. You can get even more for less with printers using PostScript-clone interpreters.

New laser engines and falling memory costs have chopped prices, and competition is driving down licensing fees for true PostScript. "Adobe is getting more and more aggressive with licensing," says Carolyn Perrier, product manager for Epson's PostScript-compatible EPL-7500. "It no longer has a monopoly."

Adobe is making a concerted effort to nail down as much market share as possible before Microsoft and Apple get TrueImage/TrueType on the street. Originally scheduled for fall 1990, the PC iteration awaits software support from *Windows 3.1*, which may not ship until June.

Adobe is battling its PDL opponents by opening up its font-scaling specifications to third parties, who have been aggressively marketing thousands of compatible fonts. And printers supporting some PostScript Level II enhancements should appear around midyear as well. Like TrueImage, PostScript Level II is streamlined to churn out pages much faster. Color and data compression are being added.

Adobe also is getting serious about the huge base of LaserJet owners. It offers a $495 PostScript cartridge that sells on the street for about $300, like a hot-selling Pacific Data Products clone. PostScript and compatible cartridges are being snapped up at nearly the same 20,000-plus-per-month rate as PostScript printers, notes BIS CAP.

Adding to the options, the first PCL 5 clones should appear this quarter. Printer manufacturers plan to offer alternatives to the LaserJet III's Resolution Enhancement scheme, and many are turning to powerful RISC-based controllers as well. —*Mike Hogan*

PostScript Laser Printers

Low-priced options

Apple LaserWriter NT	$3299
Epson EPL-7500	$3299
NEC Model 90	$2495
QMS PS 410	$2795
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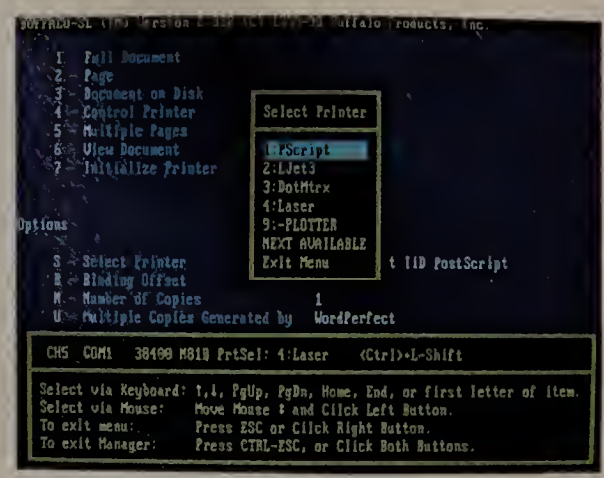

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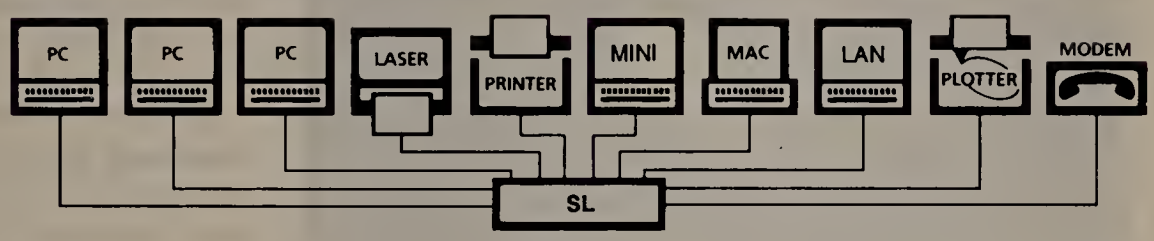

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Users Turn Toward Higher-Speed Modems

Pricing, Throughput Improve on 9600-bps Models

Running an in-house desktop publishing service for Arthur Andersen Consulting in Dallas, John Noxon frequently swaps big text and graphics files with the Chicago office. "2400 bps was fine for sending text and numeric data files," says Noxon, "but as we became more involved in graphics, we needed more speed." A roomful of executives would sit around for 2 hours waiting for files to download—but that dropped to 15 minutes once Noxon bought a 9600-bps modem with data compression.

John Robinson of Cox Enterprises, who bought 9600-bps modems to connect remote offices with a minicomputer in Cox's Atlanta headquarters, suggests buying modems that support V.32.

ANN STATES

Many other users are finding that growing files, telephone costs, and seductive pricing are pushing the 9600-bps modem toward the forefront of PC communications.

"We're at the kind of transition point we saw several years ago between 1200 and 2400," says Dennis Hayes, president of leading modem maker Hayes Microcomputer Products of Norcross, Georgia. International Data Corporation says the number of 9600-bps modems sold worldwide by U.S. vendors will more than double from 230,000 in 1989 to a projected 470,000 this year.

The sales shift reflects a fall in 9600 prices. Microcom in Norwood, Massachusetts, brought out its first 9600 in June 1988 for $1599. A current model costs only $1095 and has four times the effective throughput, thanks to data compression. "The technology is definitely there," says Pat Sullivan, Microcom's manager for modems.

During the past three years, modem wholesale prices have fallen by almost 37 percent, while effective throughput kept climbing, notes IDC. "When you look at cost per bit, it's gone down dramatically," says Jonathan Zakin, executive vice president for U.S. Robotics of Skokie, Illinois. "And that's how you pay for the modem in terms of phone usage."

Solidifying Standards

Greater standardization also simplifies buying decisions. Just months after Hayes rolled out the Ultra 96, which conforms to the V.32 standard, shipments matched those for Hayes's older V-series 9600-bps modem, which uses a proprietary modulation scheme.

Microcom's MNP-5 protocol is very much a standard on V.32 9600-bps modems. And Microcom is extending the protocol—for instance, an MNP-10 standard copes with poor-quality overseas lines. However, the international V.42 error correction and V.42bis data compression protocols are being adopted rapidly at the high end.

You pay more for more advanced and flexible error correction and data compression. At the low end, the U.S. Robotics internal Courier V.32 lists for $895. In contrast, the $1199 Hayes Ultra 96 adds V.42, V.42bis, and niceties such as support for packet-switched data networks.

John Robinson, corporate information director for Cox Enterprises of Atlanta, uses 9600-bps modems to let PCs in Cox's far-flung empire run applications on the headquarters minicomputer. Proprietary 9600 schemes worked well for users who had the right Hayes modem. But now Robinson advises buyers to choose models adhering to V.32. "It's nice to have people be able to call in with another modem," he says.

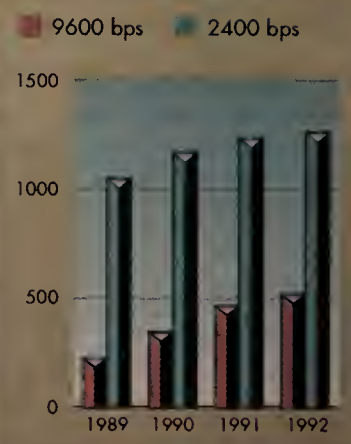
2400 bps Retains Role

At around $200 on the street, 2400-bps modems with MNP-5 remain strong contenders for many applications—particularly if you don't move big files daily over long-distance lines. Even with a 9600 model, you may wind up working at 2400 bps or lower anyway if you suffer from noisy phone lines in a rural area or on overseas calls. Additionally, multitasking systems such as *Windows* may drop bits while transferring files at speeds as low as 2400 bps. (Hayes fights back with a $299 Enhanced Serial Port, whose on-board coprocessor takes over communications management duties and lets you transfer data as fast as your modem allows.)

Finally, the small installed base of 9600-bps models is a drawback. But the base is growing, and sales will be further encouraged as bulletin board services and bigger information utilities move to higher speeds. For one, CompuServe of Columbus, Ohio, plans to introduce 9600-bps service in ten cities this year. —*Mark Henricks*

High-Speed–Modem Sales Advance

Worldwide shipments of dial-up modems by U.S. vendors, in thousands



International Data Corporation sees sales of 9600-bps modems increasing steadily as prices fall, standards become better accepted, and application files grow in size. The market for 2400-bps modems will grow more slowly.

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"Low-Cost" Macintoshes Aim to Woo PC Users Away

Can Windows-Based PCs Now Match the Mac's Elegance and Ease of Use?

A duel has begun between Apple Computer's Macintosh and *Windows* PCs for the hearts and minds of computer buyers who prize ease of use as much as power.

Before *Windows 3.0*, ease of use was the near-exclusive domain of the Mac—thanks to its graphical core, quick setup, and common user interface. But premium prices prevented Apple from expanding the Mac franchise.

Finally, last fall, Apple introduced three lower-cost Macs in hopes of stemming eroding sales and attracting PC users eager to move into the graphical world. But with *Windows 3.0* offering much of the Mac's functionality at a significantly lower cost, did Apple wait too long?

A More Elegant Solution

The Mac has made its greatest inroads in graphic arts and desktop publishing applications. But enthusiasts say the friendliness and power of the Mac make all types of computing easier.

"*Windows 3.0* is a nice package, but it's not as integrated with the hardware as the Apple stuff," says one manager for a large professional services firm that has replaced many of its PCs with Macs. Most routine chores, such as setting up the system, plugging in peripherals, and copying files, are easier on a Mac than on a PC.

To set up a Mac, "all you need to do is run one application on one floppy, and in 5 minutes the system is ready to go," says Paul Bandrowski, senior microcomputer systems analyst at Sara Lee headquarters in Chicago. Setting up *Windows* is "exponentially more complicated," he adds. "It still takes time to configure applications and make sure they're operating properly." Setup problems multiply if you also run standard DOS applications. In the Mac world, there's no equivalent problem with earlier packages.

Ease-of-use handicaps remain even after *Windows* is up and running, adds Mitchell Weinstock, ComputerLand's business development manager for Apple products. With *Windows*, the user "still needs to know about file extensions, creating and removing directories—all the standard nasty DOS tasks. The Mac shields the user."

Still, *Windows 3.0* is a tremendous improvement over character-based DOS. And as virtually every major developer rushes to beef up its *Windows* work, the user encounters fewer glitches.

MICHAEL ABRAMSON

Setting up a Windows PC is "exponentially more complicated" than setting up a Macintosh, says Sara Lee's Paul Bandrowski.

The Price Factor

Although Macs may let you accomplish both routine and complex operations with greater ease, few corporations have dumped their PCs in favor of Macs. The Mac's small market share (now about 7 percent of total shipments of personal computers) has always argued against that move. So has pricing, particularly on entry-level business machines. Until last fall, if you compared costs of a fully equipped 386SX and the closest Mac alternative, the PC won hands down.

With Apple unit sales actually dropping and *Windows 3.0* approaching the functionality of a Mac, Apple could no longer afford to charge a premium, says Peter Rogers, an analyst with Robertson Stevens in San Francisco.

Cheaper systems make it easier for Macs to spread, says Sara Lee's Bandrowski. The company's desktops are split roughly fifty-fifty between Macs and PCs at its headquarters. Bandrowski expects the balance to shift as the firm begins purchasing more Macs—first in the marketing and art departments, then in groups that haven't been Mac strongholds. Bandrowski says the Macintosh LC—the lowest-priced color system—should be a solid business machine.

Genelabs in Redwood City, California, moved to *Windows 3.0* for most users as a way of offering Mac-like features for fewer bucks. But with the new Macs arriving, "we have less of an argument against [Macs]," says Bruce Hallberg, *(see Macintoshes, p. 62)*

Apple hopes that the LC, which ships in January, and other inexpensive models will lure many users into the Macintosh camp.

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Macintoshes

(continued from p. 60)

MIS manager. Although *Windows 3.0*–equipped PCs will remain the systems of choice, Hallberg says he'll OK Mac purchases where they can be justified.

Strengthened in Small Business

Most observers agree that the new Macs will be hits in small business, education, and the home market. The low-end Classic, for example, was backordered a month after introduction.

"The new systems will have a big impact on small business—users will no longer have to justify spending $5000 for a Mac when they could buy a clone much cheaper," says ComputerLand's Weinstock.

Likewise, the Macintosh LC should help Apple shore up its increasingly assailed share of the education market. An inexpensive coprocessor board lets schools run Apple II software on the LC.

Not Everyone's Swayed

But in the corporate market, Computer Intelligence of La Jolla, California, estimates that between 25 and 30 percent of U.S. companies will never buy a Mac—at any price.

"I can't even spell Macintosh," deadpans Jerry Anderson, a programmer with Rockwell International's Rockadyne Division in Canoga Park, California. The company's 620 PCs are all running *Windows*, and Anderson says it has no plans to switch platforms. The PC "is a more generically useful tool," he adds, explaining that it offers a much greater variety of business and special-purpose tools.

MARK RICHARDS

"I can't even spell Macintosh," jokes Rockadyne's Jerry Anderson, who adds that a Windows PC "is more generically useful."

Similarly, half of Sara Lee's employees still aren't using Macs today because they lack critical applications, particularly in tax and financial analysis. "We'd be a lot closer to 100 percent Macs if some strategic software were available," says Bandrowski.

Tying It All Together

Specialized software isn't the only area where the Mac is lacking, say some corporate users. Mac networking options—particularly when it comes to tying together Macs and PCs—are both limited and expensive.

Although every Mac comes with AppleTalk built in for plug-and-play networking, this option isn't fast enough for heavy-duty networking applications such as data bases, some users say. And hooking a Mac to a network of PCs is still a problem, declares Mike Drips, an analyst with U.S. Sprint in Kansas City, Missouri. Tying Macs to IBM AS/400 minicomputers is tough as well, says Bandrowski. "Costs are higher than on the DOS side of the world, and you don't have as many options."

ComputerLand's Weinstock counters that there are plenty of solutions for hooking Macs to larger systems. But Apple has not demonstrated the alternatives actively enough, so organizations often must come up with their own networking solutions.

Weighing the Trade-Offs

Even with networking difficulties and the lack of certain applications, Sara Lee has found the benefits of Mac computing well worth the hassles. Lower prices simply confirm the company's original decision to move toward Mac technology.

But "corporate customers that have standardized on IBM compatibles aren't going to throw it all away and adopt Mac technology with open arms, particularly as we enter more difficult economic times," says Bruce Lupatkin, an analyst with Hambrecht & Quist in San Francisco. Adds Rockwell's Anderson, "It takes more effort to make a PC as sexy looking, as appealing, and as intuitive as a Mac, but it's do-able." —*Roberta Furger*

Mark Henricks is a contributing editor for PC World.

Dueling Graphical Desktops

Suggested retail prices (excluding monitors except as noted)

System	Configuration	List price
Macintosh Classic	7.8-MHz 68000 CPU, 2MB of RAM, 40MB hard drive	$1499 (includes built-in monitor)
IBM PS/2 50Z-031	10-MHz 286, 1MB of RAM, 30MB hard drive, VGA graphics	$2745
Dell 210	12-MHz 286, 1MB of RAM, 40MB hard drive, VGA graphics	$1500[1]
Macintosh LC	16-MHz 68020 CPU, 2MB of RAM, 40MB hard drive, supports 256 colors	$2499
IBM PS/2 55-061	16-MHz 386SX, 2MB of RAM, 60MB hard drive, VGA graphics	$3895
Dell 316 SX	16-MHz 386SX, 1MB of RAM, 40MB hard drive, VGA graphics	$1700[1]
Macintosh IIsi	20-MHz 68030 CPU, 2MB of RAM, 40MB hard drive, supports 256 colors	$3898 (includes $129 for keyboard)
IBM PS/2 70-061	20-MHz 386DX, 2MB of RAM, 60MB hard drive, VGA graphics	$4745
Dell 310	20-MHz 386DX, 1MB of RAM, 40MB hard drive, VGA graphics	$2799[1]

[1] Sold direct.

Apple's low-cost Macintoshes may give Windows PCs a run for their money. Comparably configured PCs from IBM list for well above their Mac counterparts, but Dell's systems are competitively priced. (Figures quoted in International Data Corporation's October 1990 PC Pricing Report.)

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SKID ROW
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Accountants? Any accountants here hop in the back.
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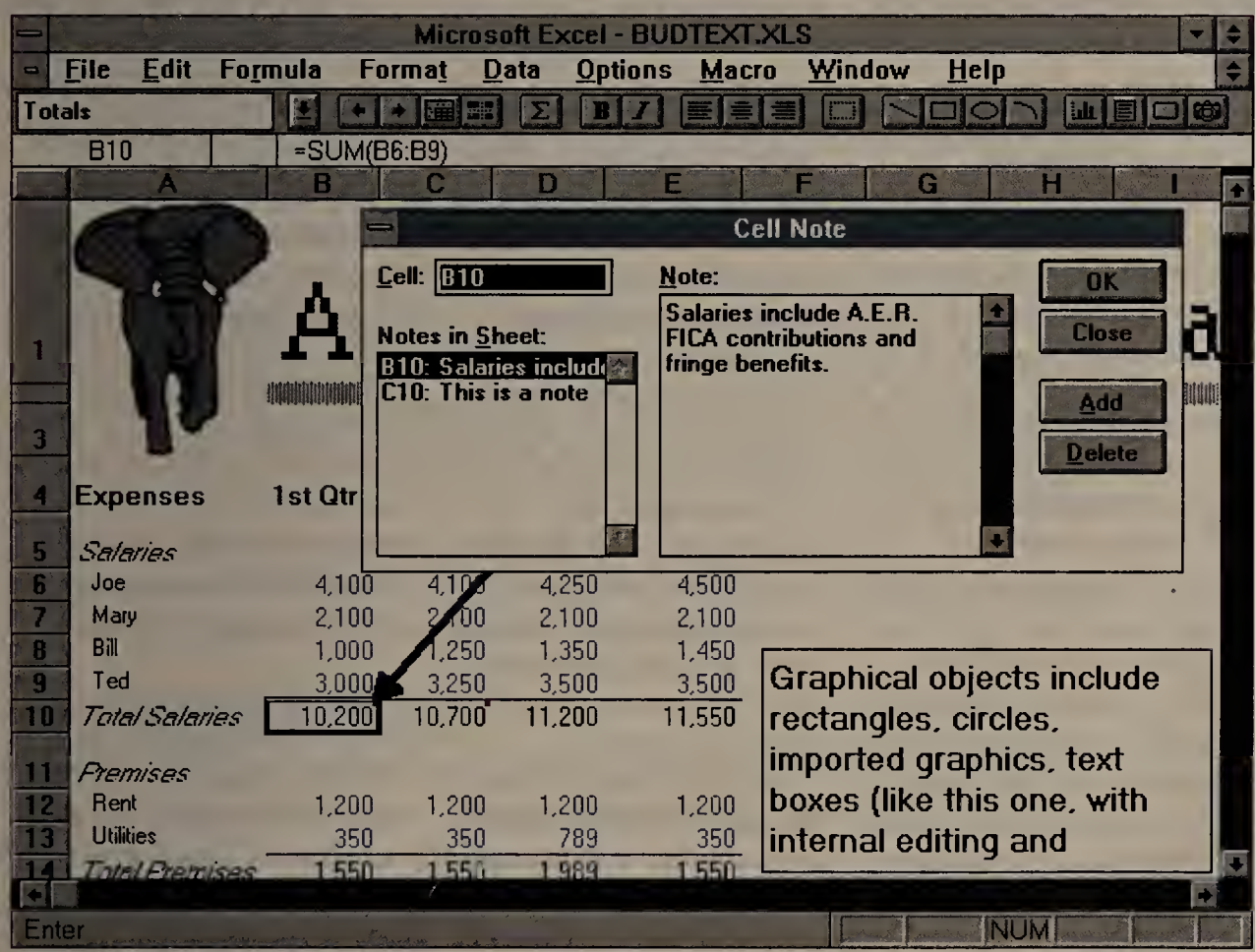
Excel 3.0: The Push-Button Spreadsheet

More than just a bevy of power features, Excel 3.0 brings quicker, easier access to spreadsheet computing.



When data alone doesn't tell the whole story, Excel 3.0 lets you attach cell notes that explain or comment on key figures. Graphical objects, such as arrowheads, can also be added to worksheets.

Richard Scoville

Microsoft Excel for Windows 3.0 is a cornucopia of timely additions and canny improvements that vastly enhance spreadsheet appearance and handling. It focuses on giving ordinary users easy access to often-used features, and in this it is nothing short of spectacular.

Current *Excel* users will be struck first by a *Word-for-Windows*–like tool bar across the top of the screen. Take the commands and features you use most often, add a few nifty new ones, then assemble them in a row of buttons. Need to sum a column? Just select a cell at the bottom and click the Autosum button. Want to right-align a column? Select it and click a button.

Double-clicking in *Excel 3.0* now takes on the hypertextlike meaning of "step inside and edit this." Double-click on a SUM function, and *Excel* shows you how that figure was arrived at. You can even double-click on a formula containing a reference to a cell in another worksheet, and *Excel* will open that worksheet and select the referent cell.

Microsoft has also made the upgrade path for *1-2-3* users much easier. *3.0* offers *1-2-3*–specific help, with a dialog box that describes *Excel* equivalents of *1-2-3* commands; you can execute these equivalents from within the help system. *3.0* also makes it simple to convert *1-2-3* macros.

Like *PowerPoint* and Aldus's *PageMaker 4.0*, *Excel 3.0* supports the Dynamic Data Exchange extension for linking and embedding objects (such as worksheets and charts) between applications. Once a chart created in *Excel* is copied into *PowerPoint*, for instance, simply double-clicking on it brings up *Excel*.

The Outliner–Spreadsheet Marriage

Many worksheets, notably budgets, are organized in a hierarchical outline format. So marrying an outliner to a spreadsheet is a natural, and *Excel 3.0*'s outline feature is a

SNAPSHOT

Microsoft Excel for Windows 3.0

The premier graphical spreadsheet adds features and functionality to simplify the most common spreadsheet tasks.

KEY FEATURES

- **Tool bar provides quick access to basic functions**
- **Outliner aids creation of hierarchical worksheets**
- **Name-based consolidation**
- **Drawing tools help communicate key results**
- **Special 1-2-3 help and compatibility features**

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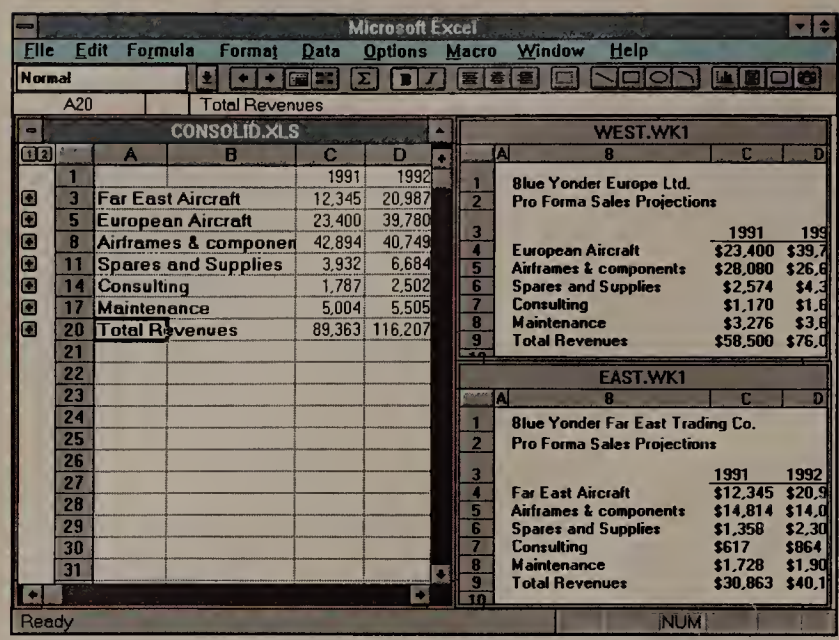

Summarizing data from like worksheets is a breeze with Excel 3.0, whose smart consolidation feature totals up data across worksheets based on matching row or column labels. The resulting outline is a summary of the data in the detail ranges.

real honeymoon. You select rows or columns containing detail information and then "demote" them to the next lower outline level; the resulting hierarchical structure can have up to seven levels. Once you define your outline, you can collapse detail rows at any level with a single mouse click.

Budgeters will appreciate *Excel*'s smart consolidation feature (previously available in *Excel for OS/2*), which summarizes data across worksheets based on matching row and column labels. Instead of forcing you to build repetitive interworksheet formulas, *Excel* builds an outline based on the labels it finds in the detail ranges. The resulting summary is based on linked formulas; by double-clicking on one, you can zoom directly into the detail sheet that feeds it. Slick!

If you need true 3-D tables in a single worksheet, *Excel 3.0* can't help. But if, like most *1-2-3 3.1* users, you enter the third dimension only to organize complex worksheets, you'll do fine with *Excel*'s enhanced intersheet formulas and its ability to save a group of files as a "workspace." External cell and range references in complex formulas now can refer to any combination of open and closed worksheets. *Excel* even tracks the path location of a referent cell. If you save the referent sheet in a new directory, *Excel* updates the formula; if the referent sheet is missing or renamed, up pops a dialog box asking for a new referent file.

Excel's approach is more straightforward for users who simply want to consolidate a series of similar worksheets. High-end users or application developers may well prefer *1-2-3 3.1*'s approach, which lets you more easily coordinate separate work areas within one 3-D worksheet file.

Dressing Up, Stepping Out

Excel 3.0 brings report formatting to a higher level. Take, for starters, a new feature called Cell Styles. As in *Word* or *PageMaker*, you simply define and name a style, then apply it to new ranges.

By defining several worksheets as a "workgroup," you can apply formatting, styles, and cell entries across sheets. Any page setup changes affect all sheets in the workgroup. Unfortunately, workgroups are not permanent or nameable: Make a selection in another sheet, and the workgroup selection is canceled.

Sometimes rows and columns alone don't tell the whole story. *Excel 3.0*'s cell notes let you attach notes on worksheet cells. A discreet on-screen marker indicates cells with notes attached.

Take your basic worksheet, grab a grease pencil, and draw some boxes, arrows, and notes right on top of your spreadsheet cells. Sound like fun? It's also a powerful way to make your points to co-workers. These graphical objects include rectangles, circles, text boxes (with internal editing and formatting), lines (with arrowheads), curves, and charts. You can size objects, layer them, attach them to worksheet cells, and group several into a single complex object for easier editing.

Creating a chart with *Excel* becomes even easier: Select a range, press the graph button on the tool bar, draw a box on the worksheet, click, and a graph appears. Double-click on the graph, and you're in a conventional chart document, ready to make your changes. *Excel* also now offers 3-D graphs and charts.

Excel 3.0 takes what-if analysis via charting to the extreme. Select a data series, hold down the <Ctrl> key, and you can move a data point in a graph until you achieve the right "look." *Excel* changes the corresponding value in the worksheet as well.

Tweaks and Tucks

Excel's Solver provides easy solution of complex what-if problems. It lets you designate a series of input cells whose values are to be optimized and a set of formulas whose values are constrained to fall within a range you specify. Optionally, you designate a single cell whose value should be maximized, minimized, or approach a target value. Click on *Solve*, and the input cells soon display the values closest to an optimal solution. Like *1-2-3/G* and Frontline Systems' *What-If Solver* add-in for *1-2-3*, *Excel* uses nonlinear programming methods that handle a wider range of problems than the linear approach available in *Quattro* or *SuperCalc*.

Excel's spreadsheet-based data base features are mainly unchanged, except that where you had to select a range before each extract operation, you now set the range once and extract to it from anywhere in the sheet. *Q+E*, Pioneer Software's add-in for querying SQL data bases, is bundled, for true relational data base capabilities.

Among a grab bag of other enhancements, you can assign a macro to a button and attach it to a graphic object or worksheet. You can customize a 16-color palette and include up to 256 unique fonts in a worksheet. A fit-to-page feature lets you squeeze your print range onto a single page, and there are many new options for formatting page headers.

Taking Care of Business

Excel now roughly matches *Quattro Professional* in file-linking capabilities; *1-2-3 3.1* still makes it easier to construct and manage modular spreadsheets. While *1-2-3 3.1* and *Quattro* now tout solid spreadsheet-publishing power, neither is as smooth as *Excel*'s made-for-*Windows* design, which takes the hands-down prize for most usable spreadsheet interface. *Excel* also has clearly leapfrogged all rivals except *Wingz* with its graphical object layer for graphs and for worksheet drawing.

Overall, *Excel 3.0* achieves a new caliber of both style and substance, and its tight links to other *Windows* applications should give it a fast ride on the *Windows* juggernaut.

Richard Scoville is a PC World *contributing editor.*

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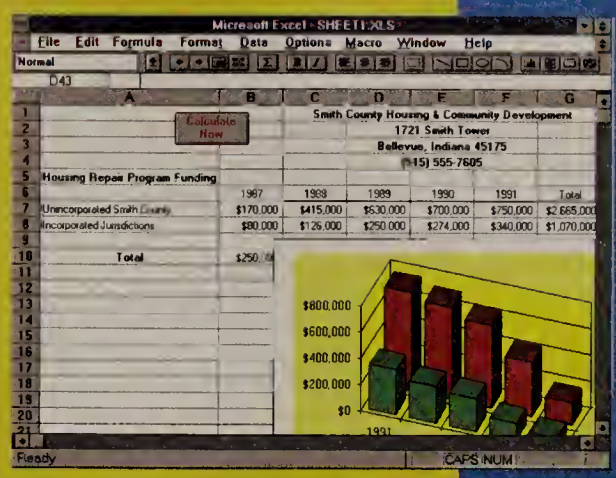

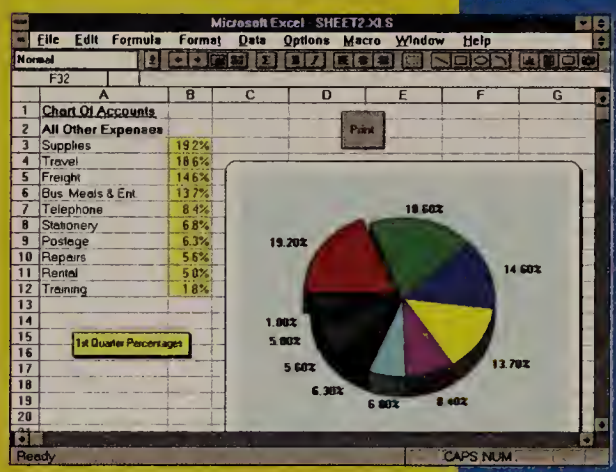

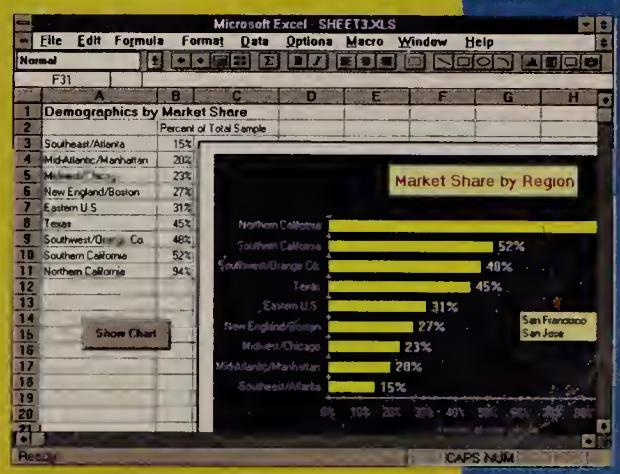

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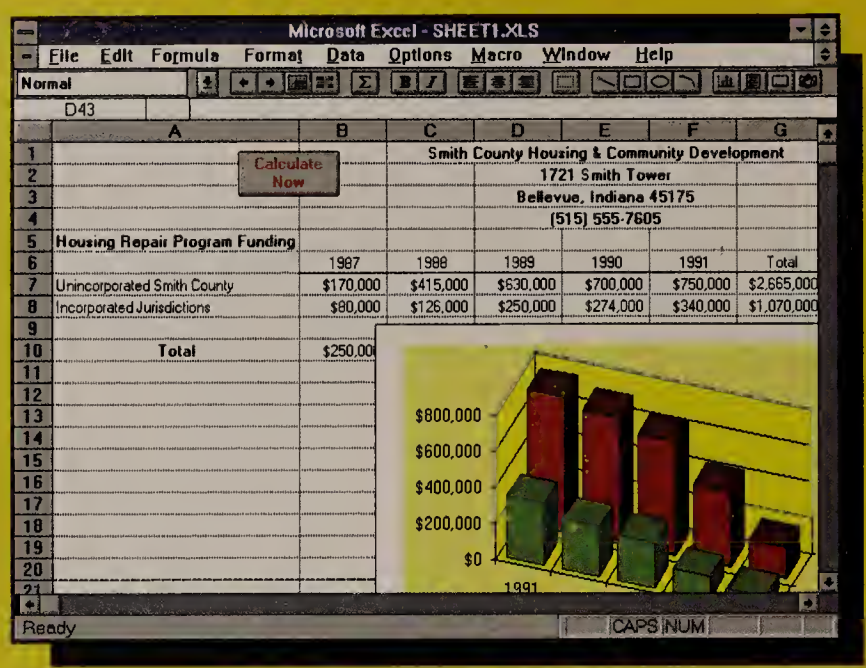

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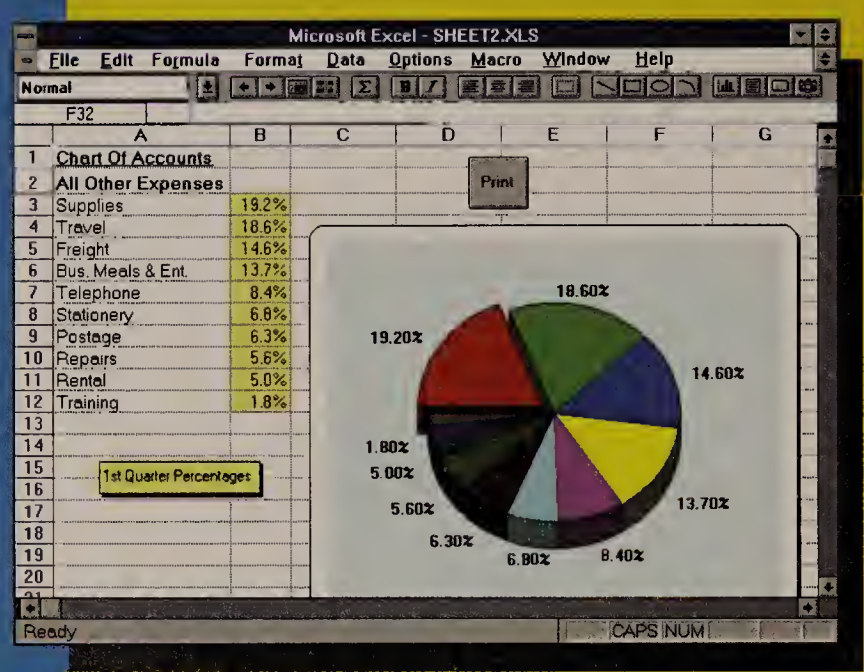

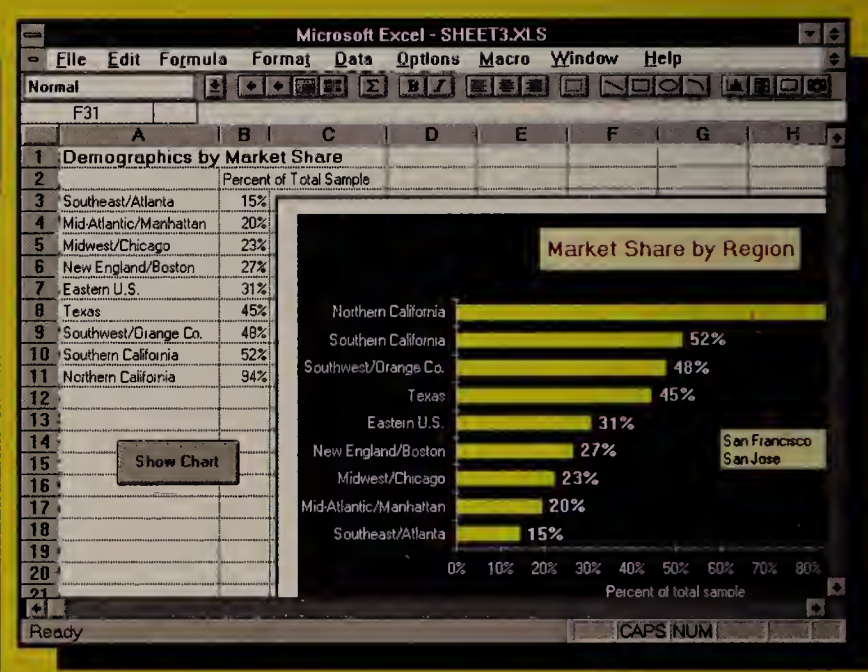

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PageMaker Tries Harder

PageMaker 4.0 gains powerful long-document features and much-needed text editing and typographic tools, making it a stronger contender in the desktop publishing market. Even Ventura users will be impressed.

Some of PageMaker 4.0's flashier features include automatic updating of linked text and graphics files, plus support for 24-bit color TIFF images and rotated text.

Richard Jantz

Ask desktop publishers which application is best for navigating book-length documents, and most will say *Ventura Publisher.* But *PageMaker 4.0,* the long-awaited upgrade of Aldus's flagship product, may inspire them to change course.

Traditionally regarded as the best choice for short, design-intensive documents like newsletters and brochures, *PageMaker* is now vying for *Ventura*'s title as the long-document king. Version 4.0 handles documents up to 999 pages long (the maximum was formerly 128 pages) and can hitch together multiple documents in a single publication. It also adds automatic page numbering and easy generation of indexes and tables of contents—features sorely lacking in version 3.01.

Enhanced long-document prowess isn't *PageMaker 4.0*'s only talent. Its built-in text editor lets you check spelling and revise imported text files without going back to your word processor. Aldus has also beefed up *PageMaker*'s typographic controls and added a table editing utility that makes it easier to import worksheets or create tables from scratch.

And *PageMaker*'s new file linking features let you automatically update your document whenever any of its component text and graphics files are changed—a boon for preparing documents created by multiple authors.

Old Map, New Course

Despite the program's many new features, old *PageMaker* hands will find themselves in familiar waters. While *4.0* fully exploits *Windows 3.0*'s color capabilities, 3-D–style buttons, and multilayered dialog boxes, it sports the same mouse-driven, pulldown-menu interface. Version 4.0 adds two menus: Element combines the old Lines and Shapes menus, and Window contains the display commands for the toolbox, style and color palettes, and other pop-up windows.

Laying out a document involves the same point-and-click simplicity that has won *PageMaker* its legions of loyal followers. You select a page setup, import your text and graphics files, and place the files in a publication window on a miniature page. You can store text and graphics in a large pasteboardlike area surrounding the page before pasting them into the document—an approach that distinguishes *PageMaker* from *Ventura,* which provides a publication window but no surrounding work area.

Documents by the Book

PageMaker 4.0 adds several *Ventura*-like features that let you put together complex catalogs, training manuals, and

SNAPSHOT

PageMaker 4.0

A major upgrade gives PageMaker the power to produce long, highly structured documents.

KEY FEATURES

- **Supports multiple-document publications; automatically generates tables of contents and indexes**
- **Built-in Story Editor with spelling checker**
- **Automatically updates linked text and graphics files**
- **Sophisticated typographic controls**
- **Spreadsheetlike Table Editor**

AVAILABILITY

Early first quarter 1991

PRICING

$795, upgrade prices unavailable at press time

Aldus Corp.
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Seattle, WA 98104-2871
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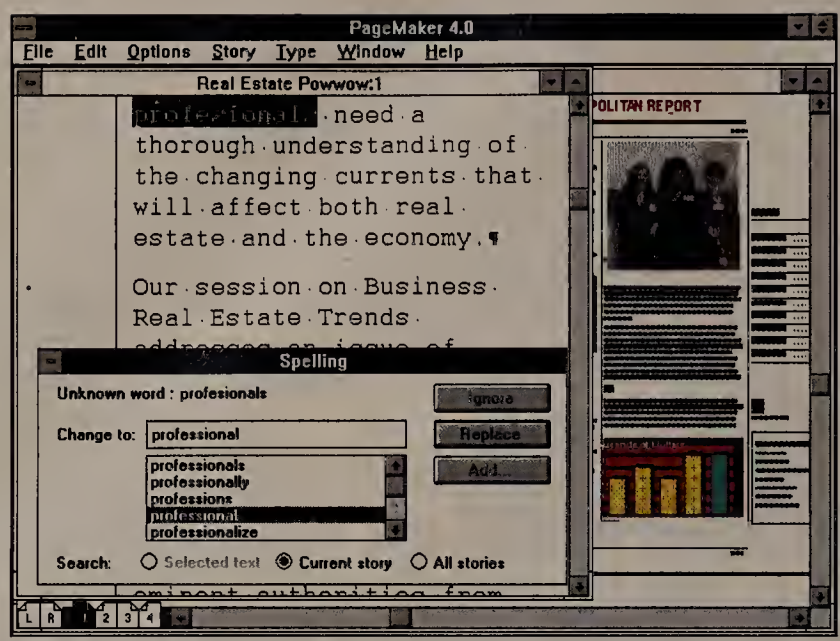

PageMaker 4.0's Story Editor is a mini-word processor that lets you quickly import and edit text—and even check the spelling of documents—without ever leaving the program.

other lengthy volumes. With the File menu's Book command, you can assemble a long "document" (actually just a list) that consists of multiple *PageMaker* publication files. *PageMaker* will paginate the entire contents in proper order, generate an index and table of contents (TOC), and print the complete publication, which can be thousands of pages long.

Creating a *PageMaker* TOC couldn't be simpler: Just click the Include In Table Of Contents box when you define the styles for each heading—"Title," "Main Head," or "Subhead 1," for example—you want listed. When you're done, select the Options menu's Create TOC command, and all the selected headings will appear in order alongside their respective page numbers. Creating an index is more time-consuming, since you must define index entries individually throughout the text. Fortunately, if your page-numbering scheme changes, regenerating the TOC or index is a simple, one-step affair.

However, *4.0* still lacks such key long-document features as a footnote facility, and the program can't match *Ventura*'s sophisticated cross-referencing or its equation editor. So for scientific or highly technical publications, *Ventura* is still tops.

Fast Text Editing

One of *PageMaker 4.0*'s best enhancements is the Story Editor, a mini-word processor with a built-in spelling checker and a search-and-replace function. The Story Editor pops up over the publication window, enabling you to enter new text, import a text file for editing, or revise an existing file. Because the Story Editor displays unformatted text, you don't have to wait for the program to redraw the entire page every time you make a revision.

The Story Editor also lets you display a list of style tags (such as Body Text) and reassign them to different paragraphs—useful for, say, quickly formatting a new subhead. And since you can have multiple Story Editor windows open at one time, it's a breeze to cut and paste text from one article to another.

You can use the Story Editor's spelling checker on a single text file or on all the text files in a document—much faster than checking each one individually in your word processor. The search-and-replace command is handy for making global changes, including replacing one paragraph style tag with another—a slick way to reformat an entire document. Overall, the Story Editor is a big improvement to *PageMaker* that helps you get your work done faster. And it's one tool you won't find in *Ventura*.

Easy File Links

Professional document production is rarely a one-person show. If your documents are produced by a handful of people working in different applications, you'll appreciate *PageMaker 4.0*'s powerful file linking features.

Like *Ventura*, *PageMaker* can update your publication's text and graphics files whenever they're changed inside their native applications. For example, if the accounting department makes last-minute changes to a *1-2-3* worksheet or your graphic artist alters an illustration in *Corel Draw*, *PageMaker* will find the latest version of the file before composing the document. And *4.0* will track linked files, telling you when each file was last modified and where it's located—even when the files are stored on different network drives.

PageMaker also features a spreadsheetlike Table Editor for producing formatted tables, charts, and schedules. You can manually enter data, import an ASCII file, or automatically convert ranges from *Excel* or *1-2-3* worksheets. The shipping version of the program should also feature Dynamic Data Exchange (DDE) embedded-object links with *Excel*. That means that if the data in a document's chart changes, *PageMaker* will automatically launch *Excel*, regenerate the chart, and then import the new chart into the document.

Designer's Choice

When it comes to design, *PageMaker* has always been tops, and *4.0* adds to the program's edge with support for 24-bit color TIFF images, Pantone color matching, and stretched, condensed, and rotated type. The program also comes with *Adobe Type Manager*, a scalable-font generator that contains 13 resident typefaces and accepts thousands more.

Other type-formatting tools let you keep headings at the top of a page, prevent paragraphs from splitting between columns, automatically add rules above or below a paragraph, and avoid widows and orphans (short single lines appearing at the bottom of a paragraph or the top of a column)—all longtime *Ventura* features. Additional enhancements include new tracking, alignment, and hyphenation controls. Still missing from *PageMaker 4.0*'s repertoire, however, is the ability to automatically generate drop caps and bulleted lists.

Follow the Leader

Although *PageMaker* now offers *Ventura* serious competition in the long-document arena, it's unlikely to inspire many *Ventura* veterans to jump ship. Novice publishers, on the other hand, might consider signing on: It's still $100 cheaper and easier to use. For current users, the upgrade is a must.

PageMaker's first major overhaul in more than two years brings with it useful story editing and file management features. Version 4.0 closes the gap between the two desktop publishing dreadnoughts—at least until *Ventura*'s next release.

Richard Jantz is a contributing editor for PC World *and author of the monthly* Art of Persuasion *column.*

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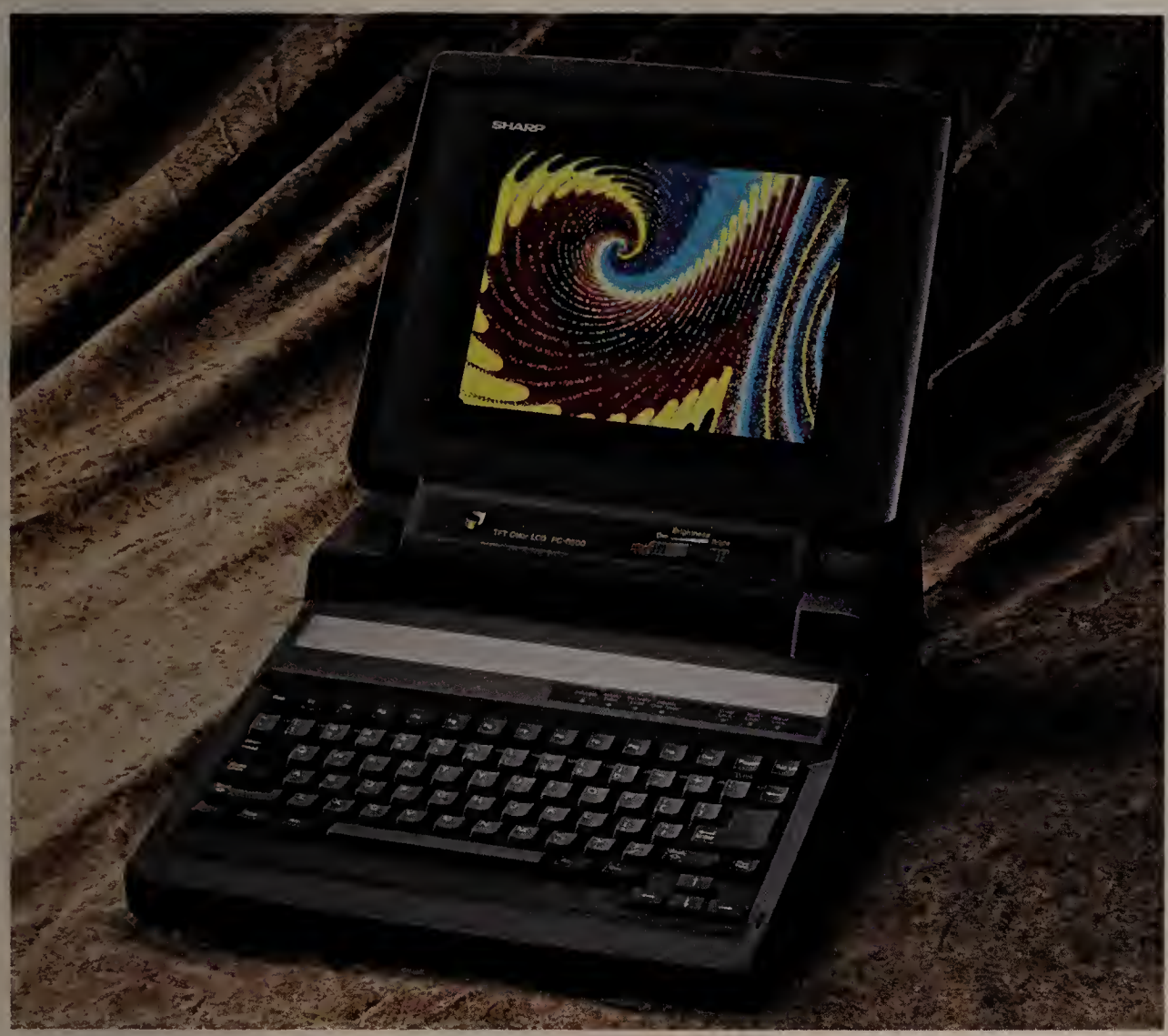
Laptops in Living Color

The Toshiba T3200SXC and Sharp Colorstar offer color screens dazzling enough to vie with your desktop monitor.



The as-yet-unpriced Colorstar gets its 256 colors from a palette of 262,144.

Mike Hogan

Day and night, dark and light. That's the difference between the flat screen color displays of the Toshiba T3200SXC and Sharp Colorstar and those of previous color laptops. In fact, you might prefer these brilliant displays to your desktop monitor.

The first commercially available PC laptops to use *active-matrix* LCD technology, the T3200SXC and the Colorstar deliver images that look every bit as bright and saturated as those on a quality desktop VGA display. Moreover, instead of the usual 16 simultaneous colors, you get 256 colors at full 640 by 480 resolution, which lends scanned color photos and captured VCR images a handsome TV look. And unlike conventional LCDs, these laptops' screens refresh quickly—no more losing the cursor if you move it faster than the screen can keep up.

Whites are *white,* blacks are *black,* and there is a good range of color shades. By comparison, viewing text and graphics on LCDs in earlier color laptops is like looking through inches of muddy water. The best of those display only 16 colors and suffer from psychedelic color shifts if you view the screen from an angle.

Because an LCD is flat, text and graphics appear clearer and crisper than on the curved surface of a standard CRT—especially at the edges of the display. You can view the screen even from the most extreme angles with very little distortion. Likewise, color is uniform even at the edges.

The active-matrix LCDs' color palettes add depth and contrast even in text mode. The T3200SXC displays 57 shades of red, green, and blue for a total of 185,193 colors, while the Colorstar sticks with true VGA's 64 shades of each for 262,144.

You Get What You Pay For

If you have to ask how much these laptops cost, you probably won't buy one. The manufacture of active-matrix LCDs requires that almost a million transistors be bonded to their correct pixel positions on a glass substrate perfectly on the first pass. Get a bad bond at a pixel, and the whole display is ruined. Until recently, manufacturing yields were so low that the resulting products would have been priced out of the market.

Sharp and Toshiba based their announcements on the assumption that yields will improve further as March ship dates approach. Both manufacturers agree that active-matrix color will require a $3000-plus price premium initially, and that most customers will balk at prices over $10,000. Toshiba has gone out on a limb and promised to sell the T3200SXC in March for $8999. At this writing, Sharp says only that the Colorstar's

SNAPSHOT

Sharp Colorstar

Better than a VGA-quality CRT, the active-matrix LCD on this otherwise standard laptop will tickle your eyeballs—but it will be a pricey pleasure.

KEY FEATURES

- **256 colors from a palette of 262,144 at 640 by 480 resolution**
- **Clear viewing from any angle**
- **20-MHz 386 CPU**
- **19ms 100MB hard drive**

AVAILABILITY

March 1991

PRICING

Between $10,000 and $15,000

Sharp Electronics Corp.
Sharp Plaza
Mahwah, NJ
07430-2135
800/237-4277

Reader service no. 683

The T3200SXC will deliver its 256 colors for $8999.

price will range between $10,000 and $15,000.

The Color Platform

Color aside, both machines are solid but not remarkable. The price and power premiums required by color remove them from the realm of popular battery-operated notebooks and place them squarely in the land of the schleppable.

Color LCDs demand ten times the power of monochrome LCDs to drive the same amount of light through the display. Thus active-matrix LCDs require AC operation, although Toshiba executives promise battery-powered color in 1992. Likewise, the fast screen response calls for another kind of power. Both laptops run at 20 MHz—the T3200SXC is powered by a 386SX chip, while the Colorstar utilizes a full 386.

The need for big 10-inch screens, full-sized keyboards, and plenty of memory and storage for graphics-intensive and even *Windows* applications has defined the color laptop footprint. Both the T3200SXC and the Colorstar are clamshell designs, weighing in at 17 pounds and 15.3 pounds, respectively, and occupying roughly 15 square inches of real estate (the Colorstar is a little slimmer at a depth of only 12½ inches).

The T3200SXC comes standard with 1MB of RAM expandable to 13MB on the motherboard, while the Colorstar ships with 2MB, expandable to 10MB. Both have a single 3½-inch floppy. Toshiba adds a 120MB hard drive, while the Sharp has a 100MB version—both with 19ms access times. Both offer a single half-sized 8/16-bit slot, while the T3200SXC provides a full-length 8/16-bit slot as well. Both offer one parallel and two serial ports plus external display and floppy drive ports, and both ship with DOS 4.01.

The keyboards do differ. The T3200SXC gives you a 91-key keyboard that includes a separate numeric keypad with cursor control. The Colorstar's numeric keypad is integrated into the 79-key keyboard, but you do get inverted-T cursor control keys.

Even at $8999, these machines will probably find their first uses among price-unconscious executives, outbound sales forces, and traveling CAD fans who just gotta have color. Average business users running standard productivity applications will need a bigger-than-average budget, personal or departmental, to board this bandwagon.

Still, if you see this display, you'll want one. And as with all computer technology, prices will eventually topple. Toshiba insists useful color removes the last true advantage that desktop PCs have over portables and calls the T3200SXC a "portable desktop."

Will active-matrix color LCDs replace "tubes" on the desktop? Both of these large TV manufacturers give an unqualified yes. One day, they say, you'll have active-matrix LCDs hanging on the walls of both home and office, displaying images from your computer, TV, and even your video telephone. That won't happen tomorrow, but LCD technology has passed a major imaging milestone today.

Mike Hogan is a senior editor for PC World.

SNAPSHOT

Toshiba T3200SXC

Barely distinguishable from the Colorstar in laptop features, the T3200SXC gives you color that's every bit as pleasing.

KEY FEATURES

- **256 colors from a palette of 185,000 at 640 by 480 resolution**
- **Clear viewing from any angle**
- **20-MHz 386SX CPU**
- **19ms 120MB hard drive**

AVAILABILITY

March 1991

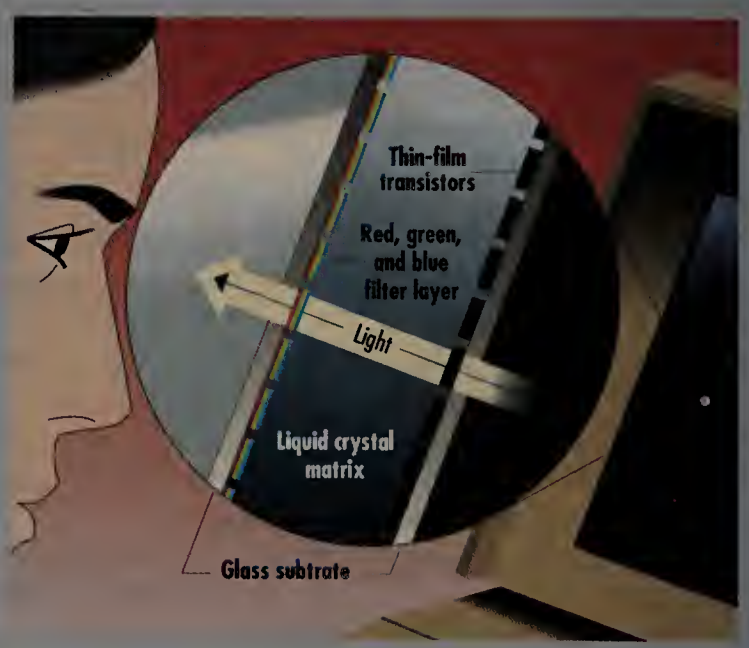
PRICING

$8999

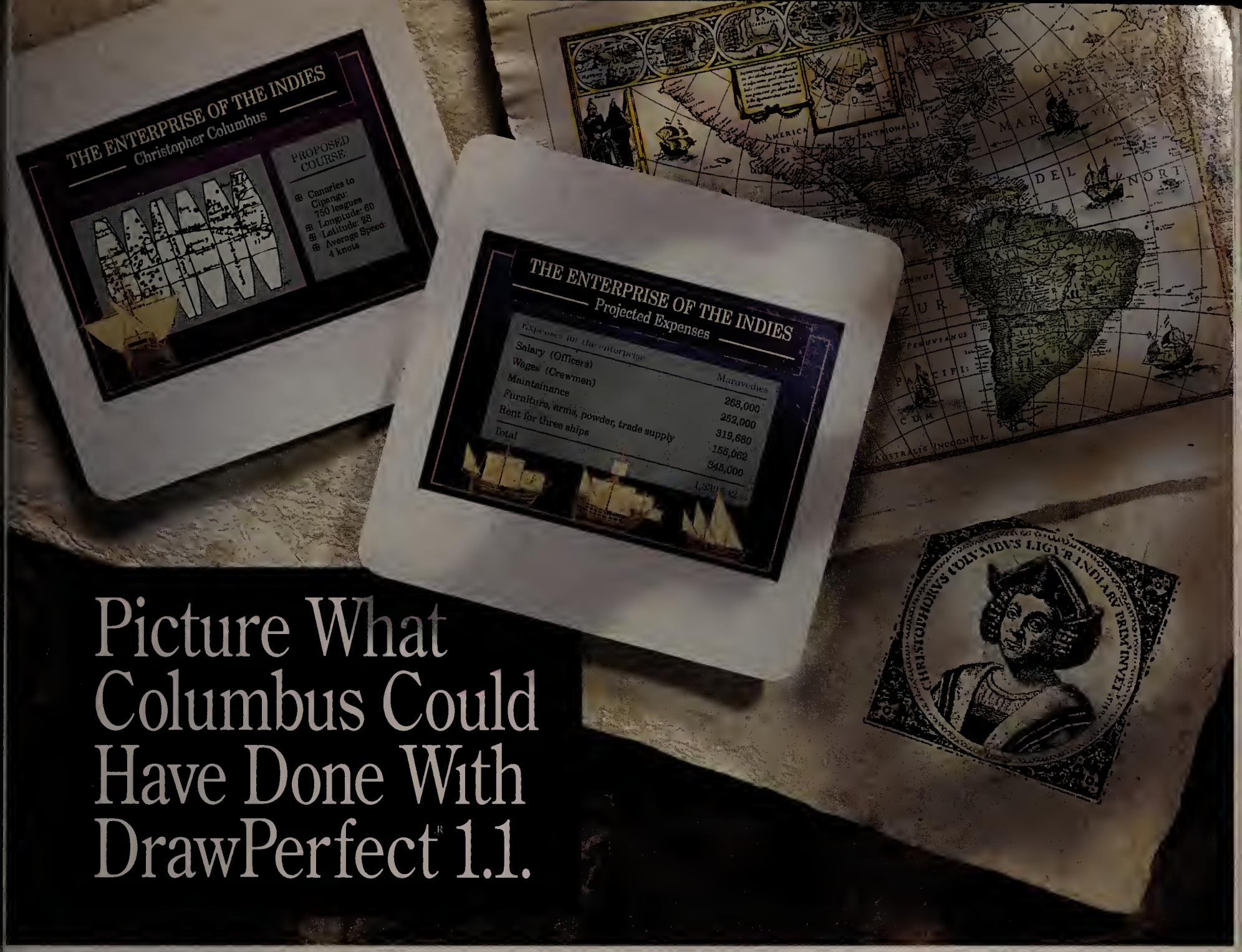
Toshiba America Information Systems
Computer Systems Division
9740 Irvine Blvd.
Irvine, CA 92718
800/334-3445

Reader service no. 684

Inside an Active-Matrix Color LCD



The Toshiba and Sharp laptops achieve an impressive 256 colors in their 640 by 480 VGA screens by exploiting active-matrix technology. These screens sandwich a liquid crystal matrix between two glass panels. Embedded in the back panel are almost a million thin-film transistors—three at each pixel position. Each transistor excites about a third of the liquid crystal matrix at that pixel position and lets varying amounts of light pass through red, green, and blue filters embedded in the front panel.



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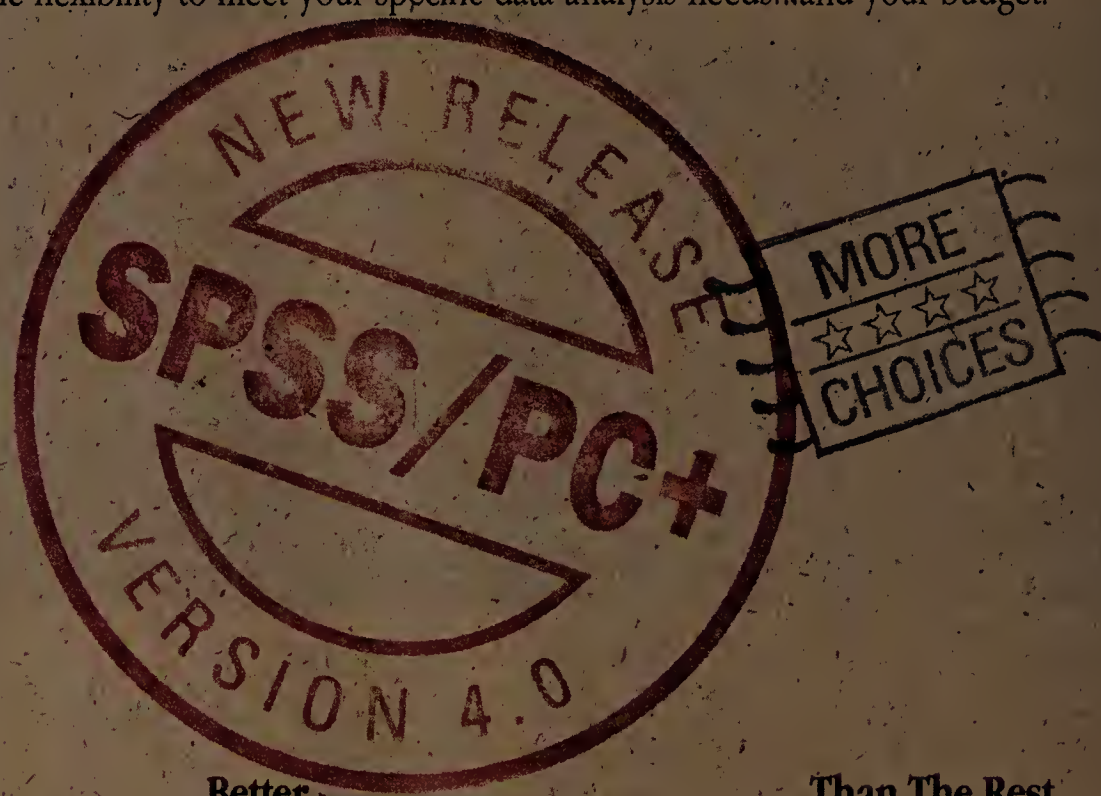

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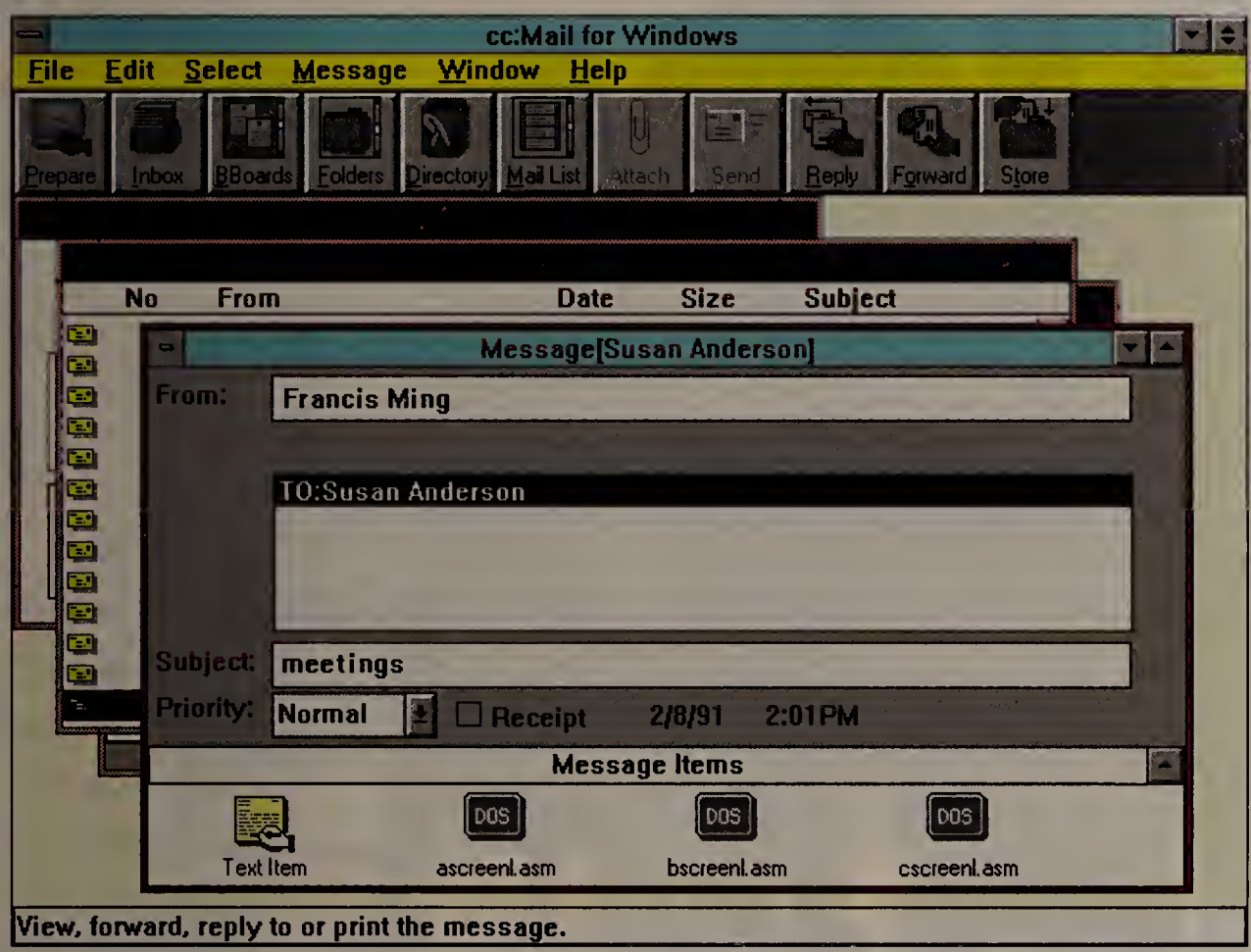
cc:Mail Meets Windows

Windows spruces up the sometimes puzzling interface and adds key benefits to the leading E-mail package.



cc:Mail for Windows icons reduce common messaging tasks to single mouse clicks. You can also switch between multiple views, including messages, folders, and mailboxes.

Eric Brown

Thanks to top features and hot connectivity options, *cc:Mail* has risen to the top of the LAN electronic mail market. The interface, however, has been a mixed bag. When you use the program a dozen times a day, you grow tired of trying to remember which menu brings up which. And should you reTrieve that message or just Read it?

With the *Windows 3.0* version of *cc:Mail*, it's much easier to find your way around. Instead of wrestling with endless pop-ups, you interact with one-stop dialog boxes.

Like its *Windows* rivals—*Da Vinci eMail for Windows* and *The Network Courier for Windows*—*cc:Mail for Windows* offers pulldown menus. Its unique feature is a customizable icon bar. One mouse click performs tasks that previously took two or three keystrokes. The icons illustrate actions such as forward, reply, and store. Click on the Prepare icon, and a large, well-designed address box appears, complete with To, cc, bcc, Priority, and Receipt buttons.

cc:Mail for Windows aids today's distracted worker by exploiting *Windows*'s multitasking skills—you can open numerous messages, folders, and bulletin boards and keep them on screen at the same time. You can easily cut and paste between these objects, and you can leave unfinished messages open. You can set up icons that launch the appropriate program with an attached file. There's no support for Dynamic Data Exchange links to other *Windows* programs.

Modular Engine Aids Add-Ons

cc:Mail for Windows incorporates a new modular messaging architecture that should establish *cc:Mail* as a base for a host of future groupware options. The new engine, which also will appear in a DOS version this year, includes API programming hooks that let developers write "mail-enabled" add-ons that are tightly integrated with *cc:Mail*, so you can choose from options such as schedulers, project managers, and forms programs. The new engine should also make it easier to use several named service directories. For example, if your NetWare LAN running *cc:Mail* is linked up to a Banyan VINES network running *Network Mail* and the Streettalk named service, you can merely enter the VINES user's name, and *cc:Mail* will deliver the message.

The *Windows* version works interchangeably with the DOS version and supports the same gateways. New options include an X.400 server for linking up to other X.400 E-mail services, a *propagator* that automatically updates directories between *cc:Mail* post offices, and an improved version of the Remote dial-in package.

With PC-based E-mail due to see astronomical growth, *cc:Mail* is determined to straddle the comet. With this version, users should enjoy a smoother trip.

Eric Brown is a senior editor for PC World.

SNAPSHOT

cc:Mail for Windows 1.0

cc:Mail for Windows brings icons and a modular interface to the interrupt-driven desktops of the nineties.

KEY FEATURES

- **Windowing interface**
- **Messaging icons**
- **Multiple open messages**
- **Icon-based program launching**
- **E-mail engine accepts add-on options**

AVAILABILITY

January 1991

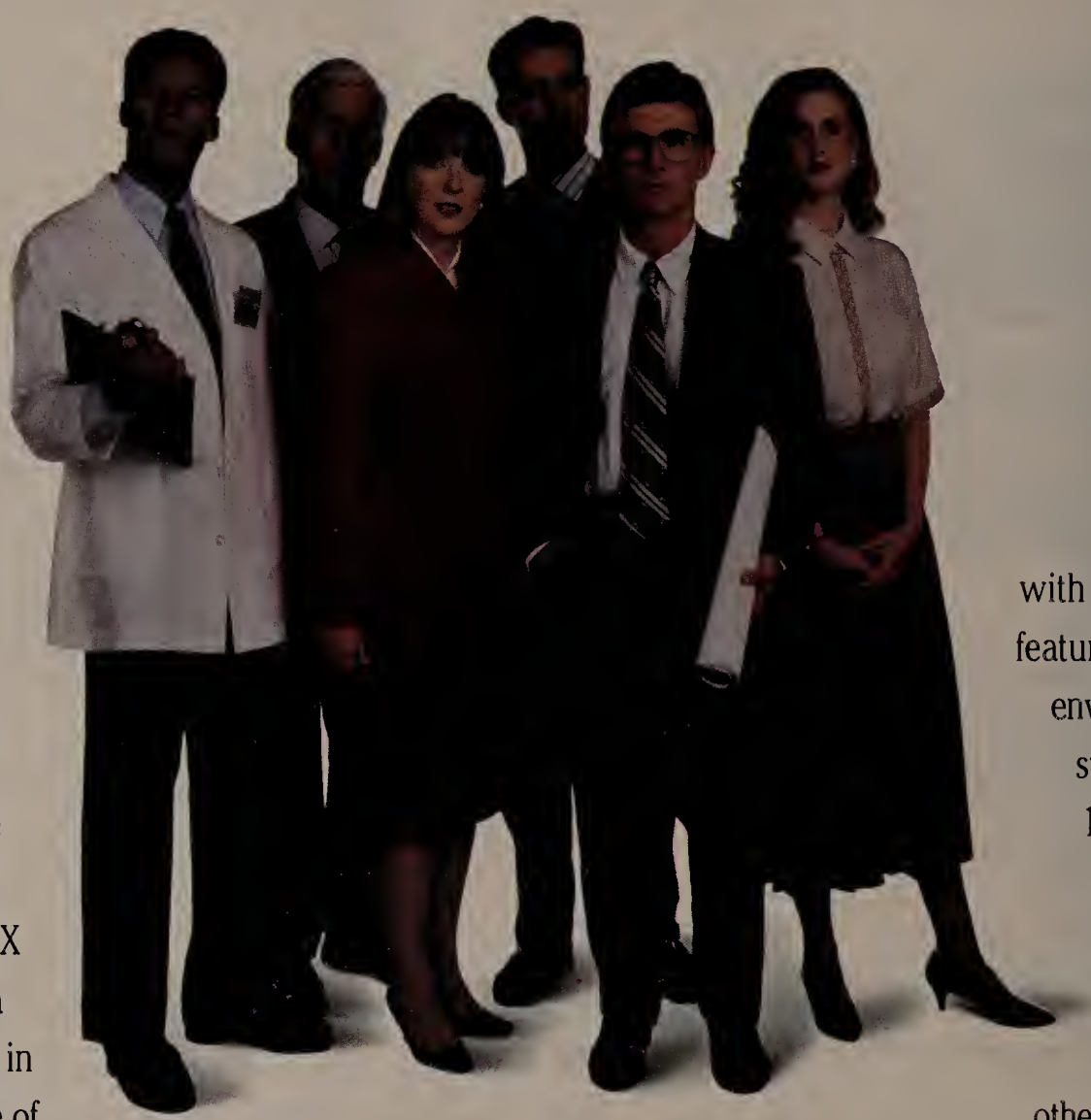
PRICING

$695 for up to 25 users

cc:Mail, Inc.
2141 Landings Dr.
Mountain View, CA
94043
800/448-2500,
415/961-8800,
415/961-8400 (fax)

Reader service no. 672

What does Compaq give 386 users who expect the moon?



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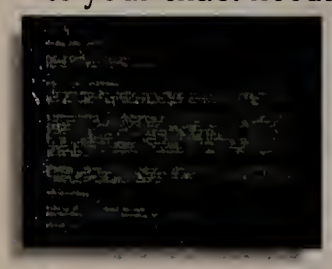

Come look at the COMPAQ DESKPRO 386N Personal Computer, for example. It's a full-function PC with breakthrough features for networked environments. As a stand-alone PC, its 16-MHz 386SX microprocessor handles all of the general business applications our other 386SX-based PCs run. With so many integrated features, you can take care of your expansion needs using only two slots.

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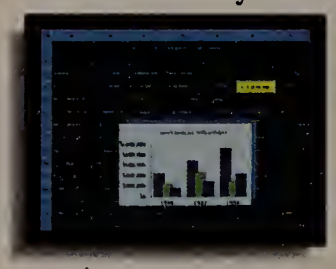

The COMPAQ DESKPRO 386S Personal Computer is also designed to handle general business applications. Its 16-MHz 386SX microprocessor gives you exceptional 386 performance. And its 32-bit architecture lets you run today's popular business software. It also offers the flexibility to run tomorrow's advanced business software.

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The stars.

Project managers and other general business users will find everything they need to manage databases and speed through complex spreadsheets in the COMPAQ DESKPRO 386s/20 Personal Computer. It delivers the maximum in 20-MHz 386SX performance and a broad range of integrated features.

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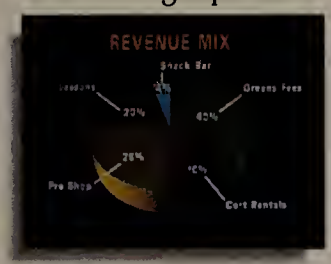

For users doing similar jobs, but with more stringent performance needs, we offer the COMPAQ DESKPRO 386/25e Personal Computer. Its 25-MHz 32-bit performance lets you fly through financial analysis as well as other demanding applications.

It's the perfect personal computer for people who are serious number crunchers, administrators who manage massive loads of information and engineers who work on generating complex two-dimensional CAD drawings.

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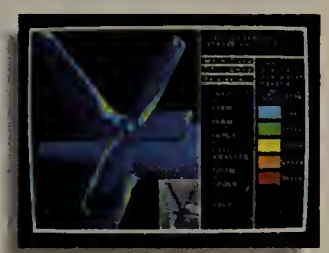

If you're looking for the 386 desktop PC that simply works better for whatever you do, call 1-800-231-0900, Operator 129. In Canada, call 1-800-263-5868, Operator 129.

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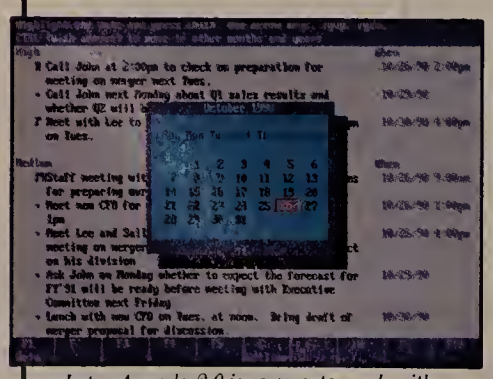

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Lotus Agenda

Finally, a word to everyone who read this ad all the way from the beginning.

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PRODUCT OUTLOOK

Edited by MIKE HOGAN

AST Premium Exec 386SX/20, Premium Exec 286/12

AST Catches the Notebook Wave With an Affordable Pair

Pick from AST's affordable notebook look-alikes—the Premium Exec 386SX/20 (above) or the Exec 286/12.

The dam has burst, and we're awash in notebook computers with features that were the stuff of dreams a year ago. Better batteries and extensive power management—not to mention 2½-inch hard disks—have enabled vendor after vendor to combine 386SX power with VGA displays and the storage options of desktops.

And you can get 'em cheap, really cheap, without having to sacrifice your penchant for designer labels. For its first foray into laptop computing, AST Research decided to get out on the edge of technology but stay in the middle of the pack on price. Its Premium Exec 386SX/20 combines the 20-MHz version of the 386SX with a VGA display, a 3½-inch floppy drive, and your choice of a 40MB or 20MB hard drive for only $3395 and $2995, respectively.

You can find still more expandable notebooks from Compaq and Texas Instruments, but at twice the price (see "SX Notebooks Hit 20 MHz," December 1990).

The Premium Exec 386SX/20 is an ultralight 6½ pounds, and its 11.4-by-9-inch footprint fits snugly into half of a typical briefcase. At 2.5 inches, it's a little tall for a notebook, partly because AST chose to use large nickel-cadmium batteries, which provide a reliable 3 hours of battery life. The AC adapter quickly recharges the battery in 3 hours if the computer is turned off.

AST also offers a 286-based version, the 12-MHz Premium Exec 286/12. CPU aside, it has everything the Premium Exec 386/20 has—VGA display, floppy and hard drive storage, even the same case. You can get a 20MB version for $2495 and a 40MB version for $2895; both can be upgraded by your dealer to a Premium Exec 386SX/20 for under $700.

The Premium Exec 286/12 is the kind of machine magazine editors were going gaga *(see AST, p. 86)*

IN BRIEF

AST Premium Exec 386SX/20, Premium Exec 286/12
Loaded with desktoplike features, AST's bargain-priced Premium Exec line brings you the best of 386SX and 286 notebook technology.
AST Research, Inc.
16215 Alton Pkwy.
Irvine, CA 92713-9658
714/727-4141,
714/727-9363 (fax)
Reader service no. 615

INSIDE PRODUCT OUTLOOK

85 **AST Premium Exec 386SX/20, Premium Exec 286/12** Bargain notebooks offer breakthrough displays and hard drives.

86 **Compression Master PC** Fit more color pictures on your hard disk.

88 **Howtek Personal Color Printer** High-res text and graphics merge in this ink jet.

88 **UnMouse** The touchpad alternative to a mouse.

90 **Central Point Backup** Now this Best Buy tool gives more information on the status of backups.

90 **The Manager's Organizer** Helps harried managers get it together.

92 **Managing Your Money 7.0** A new interface smooths the way to financial peace of mind.

94 **Texas Instruments MicroLaser XL** A fast, rugged Series II compatible with a downsized price.

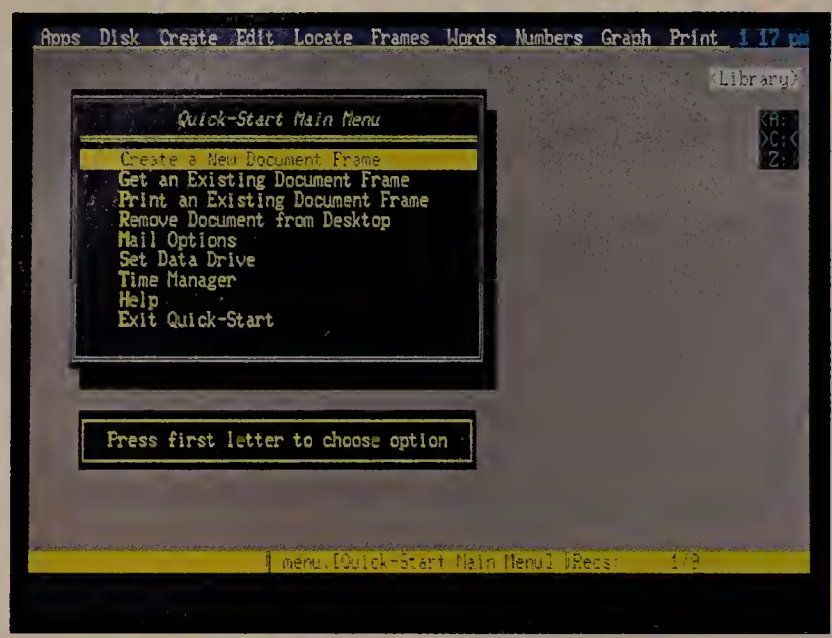
94 **Personal R:base** Brings data management home for next to nothing.

96 **Crosstalk Communicator 1.0** Simplifies *Mk.4* for the occasional user.

98 **Zeos '286 Notebook, Tandy 2810 HD, Toshiba T2000SX** Superlight notebooks that cover the waterfront in price and performance.

Framework XE

Integrated Program Gets Down—In Price and Features



Framework XE gives you most of what you'd buy Framework for, but for a fraction of the price and with a new quick-start menu designed to appeal to the infrequent integrated-application user.

Framework was born when multitasking meant juggling applications within one integrated package. Today it's mostly entry-level and light-duty "executive" users who buy integrated programs—which are often light in features and price.

Better late than never, Ashton-Tate has introduced a low-priced, down-scaled version of *Framework* that it has been selling successfully in Europe. *Framework XE* has the right price—$149—and you'll be surprised at how few features were shaved off the $695 *Framework III* to get it there.

All you give up are LAN support, the FRED developer's language, and a few word processing niceties such as the thesaurus, footnotes, columns in text, word counts, advanced frame options, and automatic hyphens. Still, the word processor is no slouch, and it includes mail merge and an 80,000-word spelling checker. You can even create compound documents with text, graphs, and spreadsheet data. And those are live links—data changed in your *XE* spreadsheet is automatically changed in your document.

Since *Framework XE* is an entry-level program, Ashton-Tate also throws in a few extras—a quick-start menu for novices, a time manager, and a calendar.

Framework XE is Ashton-Tate's entry for laptop and other single-user applications, while *Framework III* is for multiuser environments. But you can still use *XE*'s telecommunications module to send compound documents across any E-mail service that uses the MHS standard message format. You get the same wide array of import options as in other *Framework* versions, including *1-2-3*, *dBASE*, ASCII, and SYLK conversion.

Framework XE requires DOS 2.0 or a later version, 640K of RAM, and a hard disk. —*Susan Lusty*

IN BRIEF

Framework XE
Framework XE is a low-priced but not-so-down-scaled version of *Framework III* with a few features designed especially for novices.
Ashton-Tate
20101 Hamilton Ave.
Torrance, CA
90502-1341
800/437-4329
Reader service no. 632

AST

(continued from p. 85)

over only six months ago. Now it's overshadowed by the 386SX generation—and given the 286/12's low price, undeservedly so. By comparison, Compaq's popular 20MB LTE/286 has only a 10-MHz processor, a CGA display, and a $3499 price tag.

All Premium Exec laptops are equipped with 2MB of memory, expandable to 8MB, and standard 82-key keyboards with cursor keys in an inverted T and normal locations for the <Page Up> and <Page Down> keys. With full-featured little boxes like these, who needs a big one that just sits on a desk? —*Mike Hogan*

Compression Master PC

Make Big Pix Small

Color scanning entails quite a price in storage, but Compression Master PC makes it possible to keep more large, high-quality color pictures on your hard disk. This add-in board can compress an 8½-by-11-inch full-color photo—which ordinarily requires about 25MB of disk space for storage—down to 1MB.

Compression Master PC condenses image files with C-Cube's proprietary CL550 image compression processor, the same one used on the Next full-motion video compression scheme—though Compression Master PC works only with still pictures. It can help you build a data base of photos of homes for a real estate agency, mug shots for a police department, or large CAD drawings for an architectural firm.

Compression Master loses some data when performing 25-to-1 reductions. Although the amount lost from a graphics file is undetectable by the naked eye, this makes the board unsuitable for applications where you need an exact duplicate of a file, as with text files or medical images. But that's to be expected with compression of this order, and Compression Master does meet the standard set by the Joint Photographic Experts Group (JPEG).

Compression Master lets you display 24-bit, full-color images even on a monitor driven by an 8-bit VGA card. Meanwhile, the entire 24-bit image resides in your data base, ready to be printed out at full 300-dpi resolution. The board is priced at $995 and requires DOS 3.1 or a later version and an 8/16-bit expansion slot. —*Mark Henricks*

IN BRIEF

Compression Master PC
This add-in board squeezes full-color, 300-dpi images into as little as 1/25 the disk space.
C-Cube Microsystems Inc.
399-A W. Trimble Rd.
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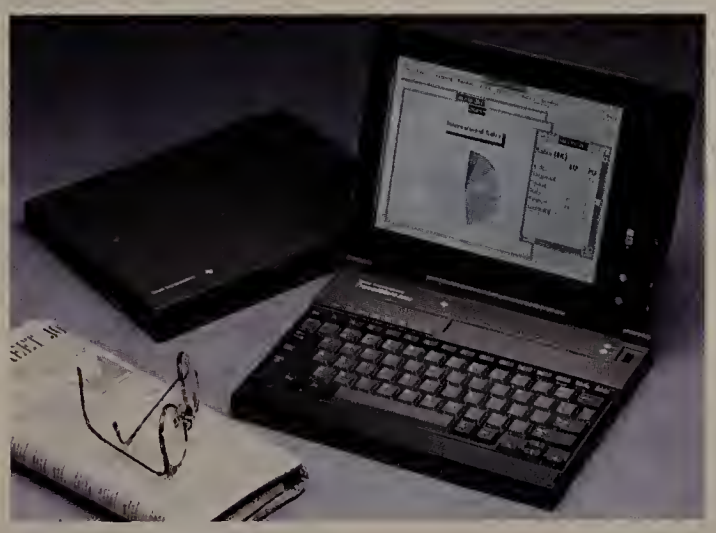

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You'll appreciate the technology behind the 10″ diagonal VGA display. It's a remarkable feature for a computer that's notebook size. The high-resolution 640 x 480 supertwist screen easily handles demanding windowing and graphics applications.

More features to meet your application needs.

The TM 2000 has the power to run your favorite software – 12 MHz 80C286 processor, 20MB hard disk drive and 1MB of RAM. A built-in, rechargeable battery lets you work up to two hours. With an optional add-on battery, you can work up to five hours – enough for coast-to-coast flights.

You also get a full-function AT enhanced keyboard, so you can work with the same feel of your desktop PC.

In addition, we've loaded MS-DOS® and LapLink™ in ROM, and preformatted the hard disk.

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TEXAS INSTRUMENTS

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Circle 295 on reader service card

Howtek Personal Color Printer

A Sharper Image

When it comes to color printing on the desktop, your choice has been right there in black and white: You could either buy an affordable, low-resolution color ink jet or swallow the expense of a 300-dpi thermal transfer device. Now Howtek offers an ink jet printer that produces high-resolution text and graphics in all the colors of the rainbow—without costing you a pot of gold.

Howtek's $2995 Personal Color Printer offers the same 300-dpi resolution as color thermal printers costing from $6000 to $10,000. That's almost twice the resolution of Hewlett-Packard's 180-dpi PaintJet, but at $2995, the Howtek printer is more than double HP's $1395 price. The Personal Color Printer is a relatively cheap way for business graphics pros to mix letter quality text and color graphics on the same page, but average users who don't need the extra resolution probably won't want the extra cost.

Like the PaintJet, the Howtek printer handles only 8½-by-11-inch paper and transparencies and comes with a manual sheet feeder and a Z-fold paper tractor. But instead of the HP's three typewriterlike fonts, the Howtek gives you one: 12-point Courier. To add typefaces, you'll have to buy plug-in font cards (prices and typefaces still to be announced) or download soft fonts into the Howtek's generous 256K buffer.

Howtek claims the printer can handle 100 sheets a day, surpassing even the $2495 PaintJet XL's conservative estimate of 20 sheets. Like the original PaintJet, the Personal Color Printer features monochrome and multicolor (cyan, yellow, magenta) ink cartridges, providing thousands of shades. Prices for replacement cartridges were unavailable at press time.

With the ability to merge text and graphics at 300 dpi, Howtek's Personal Color Printer has a features/price mix that places it right between high-end color thermal printers and HP's 180-dpi PaintJet.

Howtek says the printer will be supported by *Windows 2.xx* and *3.0* as well as major DOS applications like *Harvard Graphics* and *Ventura Publisher GEM/DOS Edition.* Emulations are an all-HP affair—the printer will imitate the DeskJet and LaserJet printers and an HPGL plotter. Warranty information was not determined at press time. —*Daniel Tynan*

IN BRIEF

Howtek Personal Color Printer
Howtek introduces the first 300-dpi color printer for under $3000.
Howtek Inc.
21 Park Ave.
Hudson, NH 03051
603/882-5200,
603/880-3843 (fax)
Reader service no. 622

UnMouse

Point and Scoot

The search for a more efficient alternative to arm-pumping, ball-spinning mouse operation has led to the merger of the touch screen and the graphics tablet. Now you can move the cursor across the screen by sliding a fingertip across the 3-by-4-inch glass surface of the UnMouse. Pressing on the glass is the equivalent of a button click, and UnMouse adjusts to differences in pressure and fingertip size.

IN BRIEF

UnMouse
A sophisticated touchpad, the UnMouse offers instant cursor movement and more programmable key options than a mouse or trackball.
MicroTouch Systems Inc.
55 Jonspin Rd.
Wilmington, MA 01887
800/866-6873,
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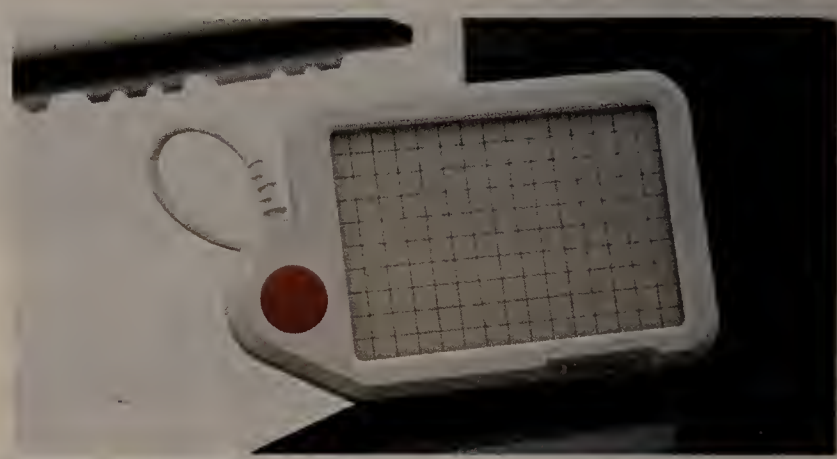
Reader service no. 629



The UnMouse touch-sensitive graphics tablet gives you fingertip control over your cursor with different modes for different applications.

A pop-up dialog box offers three modes of operation. In absolute mode, touching the tablet in, say, the lower left corner moves the cursor there immediately. In mouse mode, the cursor moves along with your finger. Trackball mode, best suited for games, lets the cursor keep moving along a vector after you lift your finger. Adjustable pointer response and a bundled stylus give you pinpoint control—enough to make drawings rather than finger paintings.

A programmable button on the UnMouse frame is the equivalent of the second button on a mouse, and sliding a template under the glass gives you 16 keys that can be programmed to match keyboard function keys. You can choose templates for *WordPerfect*, *1-2-3*, and other programs, so you don't need to switch from keyboard to tracking device to select functions.

The 6¾-by-4-inch device occupies much less space than a mouse pad, and you'll never find yourself rolling off into the hinterlands. UnMouse requires no more arm movement than a trackball, which lacks the UnMouse's programmable function key options. Priced at $235, UnMouse needs an RS-232 serial port and works with *Windows 3.0.* —*Mark Henricks*

The new look of power just got more powerful.

The new TravelMate™ 3000 notebook computer packs 386™SX power into 1.8″ and 5.7 lbs.

Finally. A truly portable 386SX notebook computer attractively packaged in a sleek, breakthrough design that complements your workstyle – TI TravelMate 3000. This latest addition to TI's powerful new look of notebook computers packs 20 MHz, 386SX processing power into a convenient 1.8″ thin, 5.7-lb. package.

Portable power for power users.

Now you can easily carry desktop performance in an exceptionally lightweight package. Run power-hungry applications with 2MB of RAM (expandable to 6MB) and a 20MB, 40MB or 60MB hard disk drive. Get the full effect of Windows® and graphics-intensive software on the TravelMate 3000's big, bright 10″ diagonal VGA display with 32 shades of gray.

The new 20 MHz 386SX TM 3000 is just 8.5″ x 11″, a mere 1.8″ thin and weighs an easy-to-carry 5.7 lbs. (including battery)!

Loading application software and file back-up are easy with the built-in 3.5″ floppy diskette drive. The internal battery lets you work up to three hours nonstop. Plus, the TravelMate 3000's full-function AT®-enhanced keyboard lets you do it in comfort.

Call today for power without compromise.

To see the new look of 386SX power, call TI for the name of a TM 3000 dealer near you.
1-800-527-3500

TEXAS INSTRUMENTS

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Circle 296 on reader service card

Central Point Backup

Best Buy Backup Steps Out on Its Own

When *PC World* reviewed backup programs in the July 1990 issue, we were surprised to find ourselves awarding the backup module in Central Point Software's *PC Tools Deluxe* a Best Buy over a number of dedicated packages. Now you can buy this fast, reliable, and easy-to-use backup tool in stand-alone form: *Central Point Backup.*

Like its predecessor, *Central Point Backup* will save to tape cartridges as well as to floppy disks, but there have been some improvements—mostly to the user interface. Three windows have been added, for Settings, Statistics, and Estimates, offering information that was there before but not as easily accessible. During backup, the Statistics box tells you how far you are into the current floppy disk. Still, the new interface is keystroke-for-keystroke compatible with the old one.

For the first time, files can be restored, as well as backed up, from the command line. Another new feature is a 2K RAM-resident scheduling program that lets you automate unattended backups. *PC Tools Deluxe 6.0* contains all the new features and improvements of *Central Point Backup,* and the new module is being made available to registered *PC Tools Deluxe 6.0* users for a nominal service charge.

Central Point Backup lists for $99, only $50 less than *PC Tools Deluxe.* Central Point Software makes it easy for you to change your mind later—each copy of *Central Point Backup* includes a coupon to buy the *PC Tools Deluxe* collection for only $50.

Central Point Backup requires DOS 3.0 or a later version and 512K of RAM. In addition to floppies, it can back up to tapes using the QIC-40, QIC-80, or Irwin formats. —*Lincoln Spector*

IN BRIEF

Central Point Backup
Central Point Backup brings you the quality backup module in *PC Tools Deluxe* without making you buy the whole toolbox.
Central Point Software
15220 N.W. Greenbrier Pkwy. #200
Beaverton, OR 97006
503/690-8090,
503/690-5187 (fax)
Reader service no. 623

The highly touted backup module in PC Tools Deluxe steps out on its own as Central Point Backup, with a new interface that provides more information about your backup alternatives.

The Manager's Organizer

New Way to MYW (Manage Your Work)

MECA Software has a new program that will do for your work what its World Class winner *Managing Your Money (MYM)* does for your personal finances. *The Manager's Organizer (TMO)* is a soup-to-nuts personal information manager for automating the core tasks of midlevel managers under five broad job functions, reflected in *The Manager's Organizer*'s six pulldown menus—File, Desk, Calculations, Personnel, Travel, and Agreements.

TMO's clear, character-based interface is almost identical to that of *MYM,* and it provides easy access to all of the functions typically found in time and contact managers—an appointment calendar, a to-do list, and an electronic Rolodex. It also includes a calculator—not just any calculator, but the equivalent of a Hewlett-Packard 12C, with financial utilities that businesspeople need to calculate net present value, discounted cash flows, bond yields, and even the impact of inflation or deflation.

Among *TMO*'s most innovative features is a personnel manager, which is designed to give supervisors quick access to detailed records on staff members' compensation, past performance reviews, job descriptions, and vacation schedules. Built-in password protection ensures that personnel information will be kept confidential.

For frequent fliers, *TMO* will prepare expense reports (enter the receipts in any order, and the program sorts by category), automobile logs, and trip reports to keep associates abreast of important meetings. And its Agreements data base enables you to maintain up-to-the-minute information on pricing, discounts, and payment schedules for key customers and suppliers.

Behind it all is a flat-file manager and a pretty decent word processor that defaults to *WordPerfect* commands but is customizable. *TMO*'s context-sensitive help provides in-depth analysis of what you are doing in every screen, just in case you forget how to set up a net present value calculation.

TMO sells for $249.95 and can be configured as a TSR for quick access from within any application. The program requires DOS 2.0 or a later version, 512K of RAM, and two floppy drives; a hard drive is recommended. —*Roberta Furger*

IN BRIEF

The Manager's Organizer
This one-stop work organizer helps you manage personnel and day-to-day obligations.
MECA Software, Inc.
327 Riverside Ave.
Westport, CT 06880
203/222-9150,
203/226-2437
Reader service no. 625

Award Winning Accounting Software Your Best Buy only $49.95

The reviews are in and Pacioli 2000™ accounting software has surpassed all expectations. Now, it has been honored by PC World as the "Best Buy". Whether you have already computerized your accounting or you are ready to purchase accounting software, please read on.

Pacioli 2000 is the hottest new accounting package on the market. Designed by J. M. Hurtado, who started the accounting software revolution in 1985 with DacEasy© Accounting, Pacioli 2000 is the FIRST full-featured, network-ready accounting software for only $49.95. It gives you everything you need while saving you hundreds, even thousands of dollars over other software. But you don't have to take our word for it. Listen to the experts.

"... the equal of other high end accounting programs in every way but cost."
New York Times, July 1, 1990

With all its power, pull-down menus, full mouse support and context-sensitive help, Pacioli 2000 is as easy to use as a checkwriter. You get examples, guides and suggestions, an automatic installation routine, and a file inquiry system that lets you make inquiries or create accounts "on the fly".

Pacioli 2000 integrates all 8 modules into one powerful system: General Ledger, Accounts Receivable, Accounts Payable, Inventory Control (including true FIFO and LIFO), Billing, Purchasing, Budgeting and Auditing. Learn one and you've learned them all.

"... a full-featured package that adds the extra element of network support."
Computer Reseller News, April 23, 1990

Pacioli 2000 is fully networkable, which means one user or any number of users can enjoy the same easy-to-use, powerful features with no additional fees. It is ready to perform as multi-user accounting software that includes multi-level password protection, file and record locking, transparent user management and more.

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PC Week, August 27, 1990

Also included is FREE unlimited customer support. If you have any questions while using Pacioli 2000, the answers are as close as your telephone. Our Customer Support Staff is always ready to help you and there are no charges or service contracts.

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We believe Pacioli 2000 is the best accounting software for today and the future. The critics obviously feel the same way. We are confident that when you try it, you too will say "Yes, it's the best buy!"

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Account # _____
Expires _____
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Make check payable to and mail to: 236
M•USA Business Systems, Inc.
18111 Preston Rd., Suite 500
Dallas, Texas 75252

Minimum Hardware Requirements: IBM or compatible computer with 640Kb, hard disk, monochrome or color monitor, mouse optional, MS-DOS 2.1 or later for single users (3.1 or later for networks), 132 column dot matrix printer in compressed mode.

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Circle 7 on reader service card

Managing Your Money 7.0

Old Faithful's New Look Helps Navigate the Financial Thicket

For those who have money to manage but not enough money to have someone manage it for them, Andrew Tobias has long provided a guiding light through the thicket of financial options and lingo—first in print and, more recently, in software.

Version 7.0 of *Managing Your Money*, Tobias' best-selling personal finance package, makes getting a handle on your budget and investments even easier. The new user interface swaps the old idiosyncratic function-key assignments for an idiotproof menu bar across the top of the screen. Cascading menus provide direct access to any part of the program, while hitting <F1> now gets you on-line help; <Esc> backs you out of the program.

All of *MYM*'s chapters are there as pulldowns, although some have been renamed to more accurately reflect your options—File, Desk, Money, Tax, Insure, Analyze, Portfolio, and Net Worth. You can keep multiple chapters open in windows simultaneously with some restrictions, but you can access any utility in Desk from anywhere in the program.

Many functions have been renamed, reworked, and enhanced. For example, the pop-up reminder pad and card file are now available from anywhere in the program. *MYM 7.0* gives you a configurable word processor, and a filer lets each family member have his or her own set of financial records.

As with MECA's new *Manager's Organizer* (which sports a near-identical interface), the expertise of Andrew Tobias is now vested in a help data base, so you can access an extensive description of each financial operation behind every screen—explaining, for example, loan amortization.

The Tax chapter gives you the most popular federal tax forms, which automatically pull your data from the rest of the program and provide an instantaneous transfer of data to MECA's *TaxCut* tax preparation program.

The archiving requirement has been eliminated in several areas, including Money (formerly Budget and Checkbook) and Portfolio, so users now have "instant" access to transaction histories. Overall, MECA claims, the time required to save new entries has been dramatically reduced, since *Managing Your Money* now saves only your latest changes rather than the entire file, as previous versions did. A new Revert feature lets you play around with what-if analysis without corrupting your original files.

The *CheckFree* connection has been enhanced in version 7.0 with easier access to the electronic bill-paying service. A new CheckAlert feature of *CheckFree* pops up to remind you on the day each recurring payment is due.

Managing Your Money 7.0 retails for $219.98. Registered users of any version can upgrade for $49.95. The program requires DOS 2.0 or a later version and 512K of RAM; a hard disk is recommended. —*Roberta Furger*

IN BRIEF

Managing Your Money 7.0
The leading personal finance manager turns 7.0 and looks better than ever, thanks to a faster-moving, easier-to-use interface.
MECA Software, Inc.
327 Riverside Ave.
Westport, CT 06880
203/222-9150,
203/226-2437 (fax)
Reader service no. 624

Teac TurboTape Mach 7, Mach 7x, Mach 5

Get Big Disk Backups in a Big Hurry

So you want to back up your hard disk fast—how does 7MB a minute sound? Teac offers a trio of TurboTape units that can give you that secure feeling in a flash. The Mach 7 is an internal, 3½-inch, QIC-compatible drive that can be installed in a 5¼-inch bay; the Mach 7x is its 6-pound external equivalent with a built-in power supply. Both units are rated to back up 160MB of data in about 23 minutes. The 60MB Mach 5 is an internal 5¼-inch model designed to back up XT- and AT-class desktop systems at a speed of 5MB a minute.

Each TurboTape comes with Teac's menu-driven backup software, which features a quick-indexing scheme, block-by-block verification, and automatic bad-sector remapping. The backup options include device, file-by-file, and full-image backups.

The software allows you to back up modified files only, to use wild cards and include/exclude lists, and to back up by file-creation date and subdirectory. A journal records unattended backups, and a tape library catalogs files and sessions for quick searches and restores. SY-TOS runs under DOS 2.1, NetWare 286 2.1, IBM PC LAN 1.12, and their later versions, and under 3Com 3+ 1.2.

All drives use CT-600N media and operate at 90 inches a second with rewind times of about 80 seconds. Each tape unit comes with a controller board and interface cable; the external model also includes a power cord. The Mach 7 lists for $1395, the Mach 7x for $1695, and the Mach 5 for $1095. —*Rex Farrance*

Teac has three new TurboTape drives, including internal and stand-alone models that back up your hard disk at up to 7MB per minute.

IN BRIEF

Teac TurboTape Mach 7, Mach 7x, Mach 5
Teac's Mach 7 and Mach 7X give you 160MB of backup at 7MB a minute, while the Mach 5 backs up 60MB at 5MB a minute.
Teac America, Inc.
7733 Telegraph Rd.
Montebello, CA 90640
213/726-0303,
213/727-7652 (fax)
Reader service no. 631

Since We Couldn't Reinvent The Hand, We Reinvented The Mouse.

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Introducing the world's only mouse specifically designed to fit the right hand. New MouseMan,™ the high-resolution ergonomic mouse, from Logitech. MouseMan's sculpted, ergonomic shape comfortably fits your right hand. And its ingenious, three-button design can save you thousands of keystrokes. Of course, it's totally plug compatible with Microsoft.® There's also a version for the Macintosh.®

LOGITECH

Tools That Power The Desktop.

For IBM personal computers and compat bles and Macintosh systems

Texas Instruments MicroLaser XL

Fast Text Printing Plus PostScript

Texas Instruments has struck another blow for smaller, faster, and cheaper. Its MicroLaser XL is a rugged, 16-page-per-minute (ppm) printer in a personal-sized box—good news for users who need a workhorse printer with an occasional touch of PostScript.

At $3499, the 300-dpi MicroLaser XL is the fastest Series II–compatible printer in its price range. Users seeking scalable fonts and PostScript graphics power can choose between a 17-font version for $3999 and a full-fledged 35-font machine for $4499. Both PostScript versions come with Adobe licenses and 1.5MB of RAM, but you'll have to add more memory if you want to print legal-sized paper or download fonts.

When printing PostScript files, however, don't expect 16-ppm performance. The MicroLaser's 12-MHz 68000 processor is fine for spitting out simple text, but it lacks the chops to handle pages with multiple fonts or complex graphics quickly. Even though TI built in two proprietary chips to help the processor manage memory and transfer data, the XL is likely to bog down under a steady diet of PostScript files from a group of users on a network.

What the XL lacks in processing power it makes up for in ease of use. Printer memory and consumables are easily accessible, and you can set up four different printer configurations—selecting fonts, paper tray, orientation, and emulation—and call them up via the front panel or software commands. For example, you can have one configuration for 8½-by-11-inch drafts in LaserJet mode, another for landscape printing on legal-sized paper, a third for envelopes, and a fourth for PostScript graphics on transparencies.

At about 16 by 16½ by 11 inches, the XL is only slightly larger than the original MicroLaser, but the 48-pound machine boasts a hefty 25,000-page monthly duty cycle. It comes standard with a 250-sheet paper tray that tucks inside the printer, further reducing space requirements, and has room for a second tray. A 500-sheet paper feeder is available for $495, and memory upgrades cost $345 per megabyte. —*Daniel Tynan*

The MicroLaser XL gives you twice the engine speed of other LaserJet Series II compatibles and has a tiny footprint and real Adobe PostScript.

IN BRIEF

Texas Instruments MicroLaser XL
TI's durable, 16-ppm MicroLaser XL offers fast text printing, a downsized case, and a choice of 17 or 35 built-in PostScript fonts.

Texas Instruments Inc.
Information Technology Group
P.O. Box 202230
Austin, TX 78720-2230
800/527-3500
Reader service no. 617

Personal R:base

Take Home Relational Power for Less

Can one of today's most advanced relational data management products find a home on your laptop or kitchen tabletop? Well, the price is right.

In the hope that you'll take it to hearth and PS/1, Microrim has slapped a Personal label in front of *R:base* and, through January 1991, is virtually giving away the $795 data base for $99.95. Thereafter, the suggested list on *Personal R:base* will be $299—a price more in keeping with its functionality, which surpasses that of even *R:base 3.0*. In fact, *Personal R:base* differs from what is now called *Professional R:base 3.1* only in its lack of LAN support and programming documentation.

But *Personal R:base* is still a fully programmable version of *R:base* that won't hinder experienced developers. Meanwhile, for the rest of us, it offers a powerful application generator for creating applications just by responding to prompts. Those programs won't have special LAN features such as password protection for simultaneous file access, but they will be otherwise fully compatible with other *R:base* versions.

A cascading menu system provides easy entry to the rest of the program—and even anticipates your next selection. Short explanatory notes of menu options are at the bottom of the screen, with longer explanations in pop-up dialog boxes and context-sensitive help a hot key away. Microrim hopes that you'll find it so easy to use, you'll choose *Personal R:base* over flat-file managers that lack the program's relational capability.

To get you off on the right foot, *Personal R:base* includes five ready-made applications: a mailing list, an appointment calendar, a home inventory program, a checkbook manager, and a recipe and shopping-list program. *Personal R:base* imports and exports native *1-2-3*, ASCII, DIF, and SYLK files and can directly read and write *dBASE III* and *dBASE III Plus* files. *Personal R:base* requires DOS 3.0 or a later version, 450K of RAM, and a hard disk. —*Mike Hogan*

IN BRIEF

Personal R:base
Personal R:base gives you a full-fledged version of *R:base* at a fraction of the normal price and throws in an easy-to-use menu system.

Microrim
15395 S.E. 30th Pl.
Bellevue, WA 98007
206/649-9500,
206/746-9350 (fax)
Reader service no. 618

Then, We Took Off In The Opposite Direction.

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LOGITECH

Tools That Power The Desktop.

For IBM personal computers and compatibles and Macintosh systems.

Mitac MPC2386E

A Super 20-MHz SX Bundle

Now that 20-MHz 386SXs are shipping en masse, many buyers are beginning to wonder whether they should bother with 16-MHz systems at all. American Mitac simplifies the decision by stuffing its 20-MHz SX with impressive features and offering it at a 16-MHz price.

Mitac's MPC2386E has a small chassis but offers plenty of room for options. The basic model is priced at $2495 and includes 1MB of RAM—expandable to 8MB of CPU-speed memory on the motherboard. One of the two half-height 5¼-inch drive bays is occupied by a 1.2MB floppy drive; there are also two third-height 3½-inch bays. *Windows 3.0* is included in the price of the machine, as is one year of on-site service.

Extensive integration is the key to the MPC2386E's small footprint and low price. Super VGA (800 by 600) is built onto the motherboard, as are the floppy controller and one parallel and two serial ports. Add 256K of video RAM for $65, and the VGA adapter can handle 1024 by 768 VGA.

You get one 8-bit and five 8/16-bit expansion slots, one of which is taken by a hard disk controller. Storage options run the gamut from a $470 40MB hard disk and controller to a $1170 200MB disk and controller.

Besides its compact design, the Mitac offers the ergonomic advantages of front-panel on/off and reset switches and three optional tilt and swivel displays. If you bring it up to the *PC World* testing configuration of 4MB RAM, 100MB of storage, and a color VGA display, the MPC2386E price tag rises to $4055, but its street price should run well below $3000. —*Rex Farrance*

IN BRIEF

Mitac MPC2386E
The 20-MHz MPC2386E packs a lot of features into a budget-priced SX that includes free on-site service and *Windows 3.0*.
American Mitac Corp.
410 E. Plumeria Dr.
San Jose, CA 95134
800/648-2287,
408/432-0866 (fax)
Reader service no. 626

The MPC2386E combines the most-wanted SX features in a small-footprint PC, with a year's free on-site service, five-day-a-week toll-free technical support, and an in-house electronic bulletin board as bonuses.

Crosstalk Communicator 1.0

Communications for the Busy Manager

Consistency may be the hobgoblin of little minds, but it's a big help when you're trying to learn a software package. A consistent interface across the entire product line is one of the design goals of *Crosstalk Communicator*, a pared-down, easier-to-use version of DCA's high-end *Crosstalk Mk.4*.

The $99 *Crosstalk Communicator* is the spitting image of the $245 *Crosstalk Mk.4*, but it simplifies things by omitting such features as synchronous operation, background mode, shared modem support, and support for 15 simultaneous sessions. *Communicator* provides the same sophisticated CASL script language as *Mk.4* but documents only the most commonly used commands. It also offers *Mk.4*'s extensive list of asynchronous terminal emulations, although it lacks support for directly controlling IRMA boards and other synchronous devices. Its list of file transfer protocols includes ZMODEM, Kermit, YMODEM-G, and every other *Mk.4* protocol except for DCA's proprietary DART protocol.

In short, *Communicator* offers almost every feature that most users need, with the possible exception of a background mode. The program borrows improvements from version 2.0 of *Mk.4*, which added a dialing directory and improved on-line help, and supports a longer list of modems. Installation is easier, with more complete prompts for guiding the novice.

Like Hayes's *Smartcom Exec*, *Communicator* is aimed directly at the "executive" market—casual modem users among whom *Procomm Plus* predominates. DCA insists that *Crosstalk XVI* will continue to be sold and supported, but it's only a matter of time before *XVI* fades away in the face of *Communicator*'s more powerful features and flexible interface. —*Eric Brown*

IN BRIEF

Crosstalk Communicator 1.0
An entry-level version of *Crosstalk Mk.4*, *Crosstalk Communicator* offers ease-of-use innovations for occasional telecommunicators.
Digital Communications Associates, Inc.
1000 Alderman Dr.
Alpharetta, GA
30202-4199
800/241-4762
Reader service no. 628

Then, We Pulled The Plug On It.

New MouseMan™ Cordless Radio Mouse

New MouseMan™ Cordless Radio Mouse is a different kind of mouse. It avoids the annoying interference problems that plague infrared cordless mice. So you can roam your desktop with total freedom. And new MouseMan cordless "sleeps" when you're not working. So a common battery lasts up to a year.

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In CA call: (800) 552-8885.
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Zeos '286 Notebook, Tandy 2810 HD, Toshiba T2000SX

...And More Notebooks at Low Prices

The Tandy 2810 HD typifies new standards in 286-based notebook portables: VGA display, on-board floppy, and 20MB hard drive.

Anyone who computes on the go must feel like the proverbial kid in a candy store. Notebook PCs come in such a variety of configurations and prices—from dirt-cheap 10-MHz 8086s to pricey 20-MHz 386SX dynamos—that it's hard to know where to begin. A good place to start is in the middle of the pack.

Zeos's brand-new '286 Notebook is a highly portable system with a VGA display, a 20MB hard drive, and a built-in floppy drive. While fast SX rivals make its 12-MHz 286 CPU seem a little slow, this notebook's $1995 price tag is one of the lowest in its class, competitive even with non-VGA 8086 notebooks.

Nor does Zeos force you to trade weight or battery life for price. At approximately 7½ pounds traveling weight (including battery, AC charger/power supply, and cables), the '286 Notebook is pretty light for its breed. Its 2-hour battery life isn't outstanding, but you may get better battery performance if you enable the power-saving options. The 5MB RAM capacity is better than average and more than enough to run *Windows 3.0.*

Fresh out of the factory, Tandy's 2810 HD offers features nearly identical to those of the '286 Notebook, including a VGA display, a 20MB hard disk, a 5MB RAM capacity—even the 3½-inch floppy drive. The clincher is Tandy's 16-MHz 286 CPU, which provides one-third faster processing than Zeos's entry.

With the hard disk and 1MB of RAM, the 2810 HD costs $2495, only $500 more than the '286 Notebook. Tandy claims the 2810 HD will run 3 hours on a single charge, and the unit weighs only 7 pounds with battery and charger. You also have the advantage of nationwide Radio Shack service should problems develop.

Now for Toshiba's entry. Like its rivals, the T2000SX includes a hard disk, a built-in floppy drive, and a VGA display, but its 16-MHz 386SX CPU should offer better performance, especially with 386-specific programs like *Windows 3.0.* Toshiba claims 3 hours of battery life (5½ with an optional battery) and a traveling weight of 8½ pounds. The T2000SX boasts a terrific keyboard—it has dedicated page control keys, 12 function keys, and cursor keys in an inverted T.

The T2000SX also has room for a whopping 9MB of RAM and comes with 40MB worth of fast, 19ms hard disk. Not surprisingly, at $5499 with 1MB of RAM, it's also by far the most expensive unit. Pick your performance, pick your price, and snap up the notebook that suits you. —*Michael Goodwin*

IN BRIEF

Zeos '286 Notebook, Tandy 2810 HD, Toshiba T2000SX
Each of these three super-light laptops stakes out a different price/performance territory.

Zeos Int'l, Ltd.
530 5th Ave. NW
St. Paul, MN 55112
800/423-5891,
612/633-4591,
612/633-1325 (fax)
Reader service no. 619

Tandy Corp.
1800 One Tandy Center
Fort Worth, TX 76102
817/390-3011
Reader service no. 620

Toshiba America Information Systems, Inc.
Computer Systems Division
9740 Irvine Blvd.
Irvine, CA 92718
800/334-3445
Reader service no. 621

TrueLaser

PostScript Today, TrueImage Tomorrow

Microtek's TrueLaser is the first laser printer to support TrueImage, a PostScript-compatible page description language that supposedly exceeds PostScript's performance and quality. Unfortunately, no software will support TrueType fonts until *Windows 3.1* ships—hopefully, sometime this spring.

In the meantime, this under-$3000 laser should have enough features to keep you happy. Its 35 built-in scalable fonts from seven typeface families match the selection offered by PostScript printers, so anyone with a program that has a PostScript driver will hardly know the difference. The printer supports Adobe PostScript Type 1 and Type 3 fonts and is compatible with HP's PCL 5, the page description language built into the LaserJet III.

The 300-dpi TrueLaser comes standard with 2MB of RAM, expandable to 3MB. The TrueLaser controller processes graphics pages up to three times faster than most PostScript printers and ten times faster than PCL 5 printers, claims Microtek. Of course, once that job is done, the TrueLaser's engine prints at an unimpressive 6 pages per minute. —*Patrick Marshall*

IN BRIEF

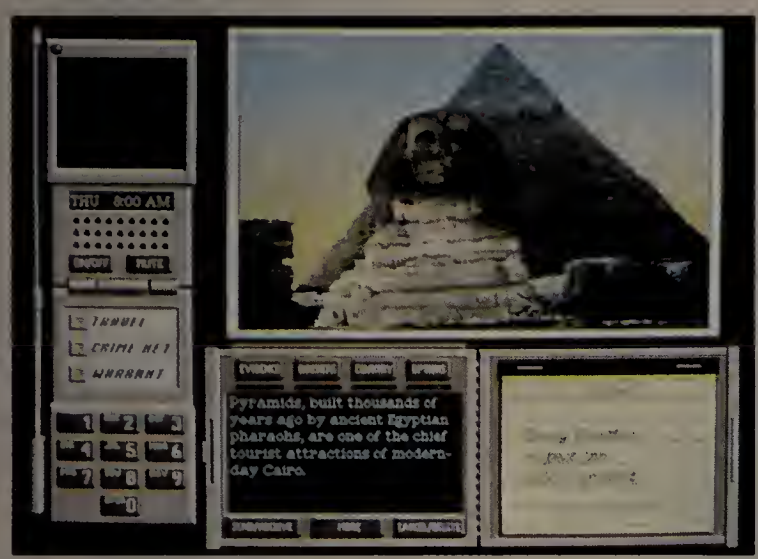
TrueLaser
The economical TrueLaser is the first laser printer to support the PostScript-compatible TrueImage language, which Microsoft claims offers better speed and quality than PostScript.

Microtek
680 Knox St.
Torrance, CA 90502
800/654-4160,
213/321-2121
Reader service no. 627

UPDATE

New Versions of Your Favorite Products

Where in the World Is Carmen Sandiego?



The deluxe edition of Where in the World Is Carmen Sandiego? is a highly graphical tour of such exotic locales as Cairo, Egypt.

If you enjoy geography and amateur sleuthing, you're well suited to answer that musical question, *Where in the World Is Carmen Sandiego?* The new $79.95 *Deluxe Edition* is a graphical upgrade to the popular series that lets you wander around the world via digitized National Geographic Society photographs in search of the notorious Carmen. You are given a week to find her and various other miscreants by following geographical and trivia clues, and you're rewarded with promotions in rank from "gumshoe" to "supersleuth." But you pay a high price for this adventure: The game requires at least a 10-MHz 286 machine with 640K, a VGA card, and a minimum 6MB of hard disk space. Brøderbund Software, 17 Paul Dr., San Rafael, CA 94903-2043; 800/521-6263.

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A more accessible interface and improved data base browsing and editing distinguish *Books Cards & Labels, Database Version.* This phone book/report generator lets you enter three names, five phone numbers, business and home addresses, and plenty of notes in each record, which you can search using various criteria. Output options for the $129.95 program are accessible via pop-up menus and include a pocket-sized address book, different sizes of Rolodex cards, and various report and label formats. A $99.95 *PrintBase* add-on lets you use your current data manager to print the same range of reports without transferring the data to *Books Cards & Labels.* Useful Software, 2301 Stokes Canyon, Calabasas, CA 91302; 818/880-4001.

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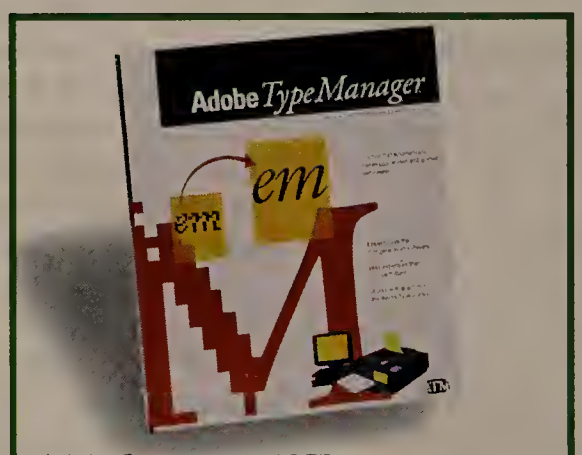

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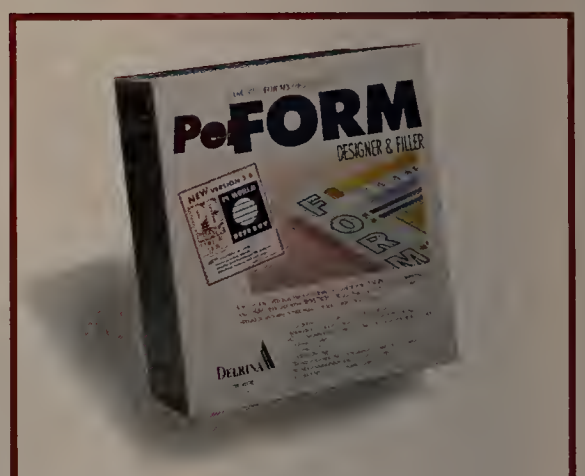

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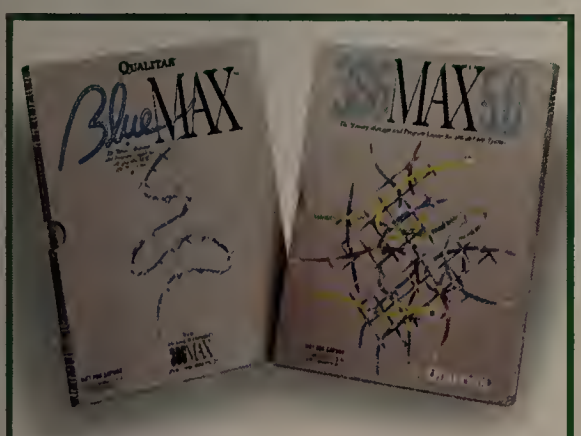

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5085 Multisync 3D Monitor . . . . . 689.

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PC Power & Cooling ... 1 year
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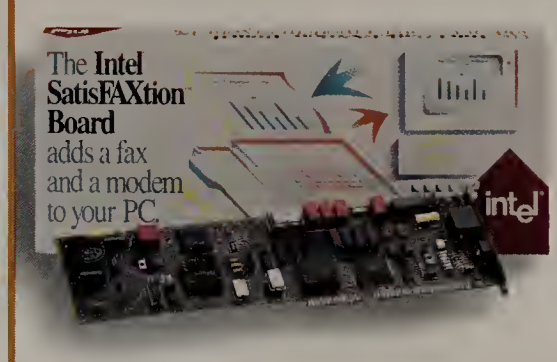

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5285 2400 Baud Ext. MNP Modem *(Lev. 5)* 209.
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7551 Bernoulli II Transportable 44 Meg . 997.
5113 44 Meg Cartridge Tripak *(5¼")*. . . 249.
2500 PC2B Controller . . . . . 229.
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5500 80-152M Int. Tape Drive . . . . . 629.
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Maxell ... lifetime
2789 5¼" MD2-D 360k Disks *(Qty. 10)* . . . . 12.
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8320 ▣*PrinTools 1.0*–Utilities for the HP LaserJet, DeskJet & compatibiles. Includes Spooler, Screen Dump, Screen Capture, SetUp, Plot with HPGL/2 support, and Help utilities . . . . . $85.

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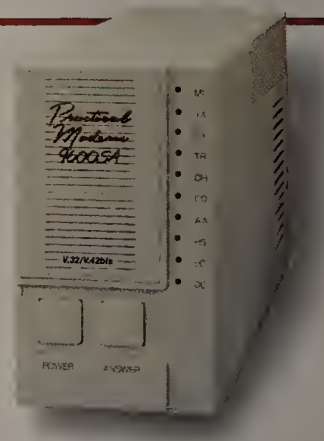

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Value Alert!

20-MHz 386SX Systems

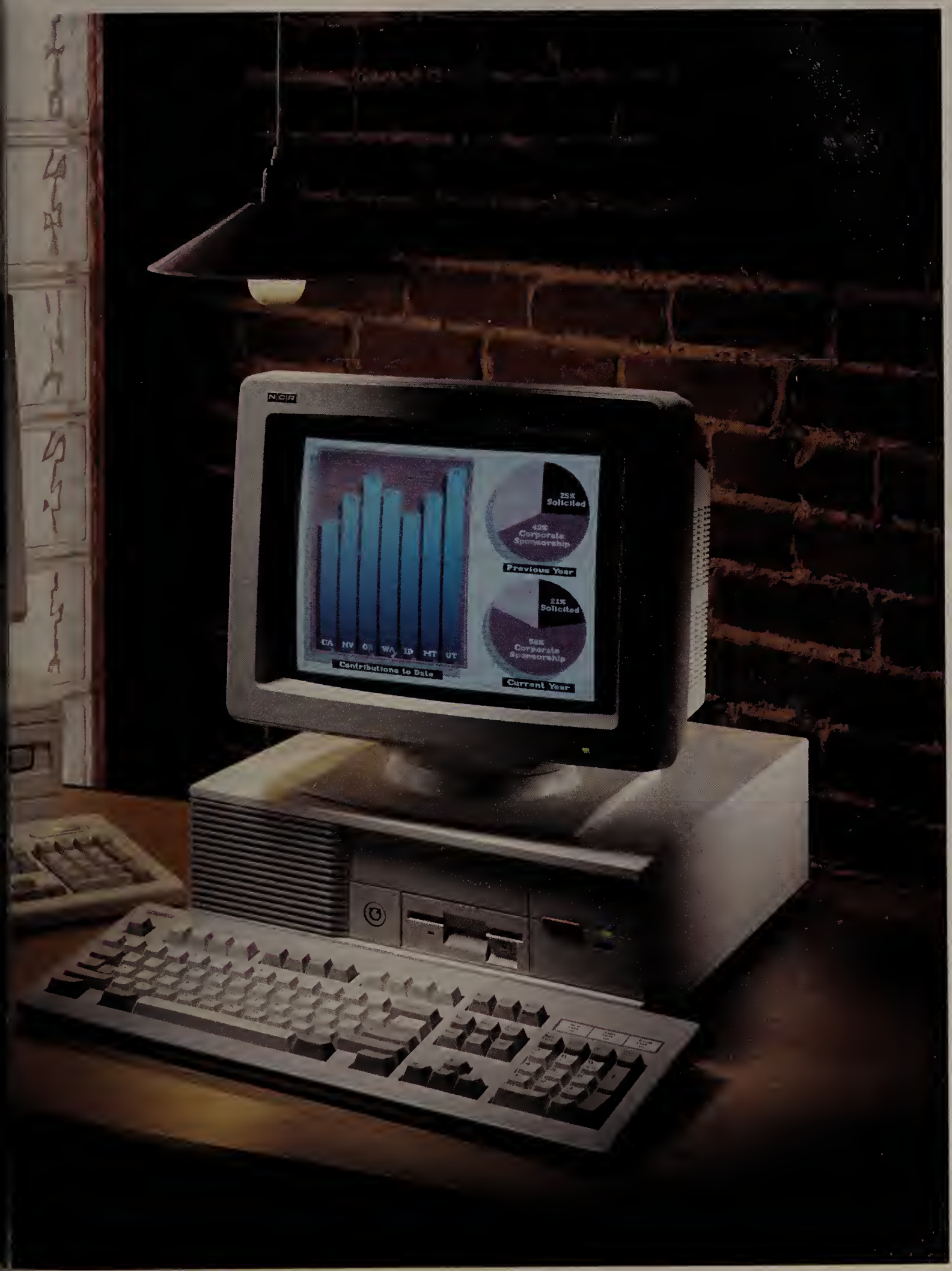
Windows-ready 20-MHz PCs now cost little more than 16-MHz systems. Yet the difference in performance is stunning.

Robert Lauriston

MARC SIMON

Looking for an inexpensive business machine capable of running all of today's hottest software? Until recently, you had only one choice: the 16-MHz 386SX. But now, with the emergence of Intel's 20-MHz SX chip, it's a new ball game. For only a few dollars more, these 20-MHz systems offer a lot more power to run CPU-intensive applications like *Windows 3.0, WordPerfect 5.1,* and *Paradox.*

How much will you pay for the extra performance? A lot less than it's worth! Most 20-MHz PCs cost only a bit



Rich or poor, everyone deserves a Best Buy. The pricey Compaq Deskpro 386s/20 is the fastest 20-MHz SX, and the NCR PC386sx20 delivers the best price/performance ratio.

The speedy ALR PowerFlex 20CSX is equally at home on the desktop or standing on the floor. Its vertically-mounted floppy drive is easy to reach if you use the ALR as a floor-mounted tower.

MARC SIMON

more than comparably configured 16-MHz systems—and our tests show that they perform about 34 percent faster.

What's more, these 20s generally boast a higher capacity for drives, expansion boards, and fast (CPU-speed) RAM. So when you spend that extra couple of hundred bucks you're getting double benefit: These systems are not only faster, they also will hold their value longer, keeping pace with new applications and the escalating demands on RAM and mass storage. Of course, you can use a similar argument to justify your buying an even faster 25-MHz 386DX system—but *that* price delta is a hefty $1000.

To help you pick the best bargain, we put six of the first 20-MHz SX systems to the test. The key buying criteria for these low-cost racers are price, performance, and capacity for fast RAM. Since price differences on these machines are vanishingly small—except for the Compaq, you can buy any one for $3600, plus or minus no more than $75—cost is not a major issue in this roundup. Capacity for fast RAM is more significant—especially if you run *Windows*, since the program will bog down if memory is short (see the sidebar "Buying Smart" for more detailed shopping tips).

We found two Best Buys. Compaq's impressive Deskpro 386s/20 is the fastest system in the roundup, but it's relatively expensive. The NCR PC386sx20 isn't quite as speedy, but it offers far and away the best price/performance ratio—and gives you super-VGA graphics in the bargain.

To arrive at comparable, real-world prices, we configured each machine with 4MB of RAM (our minimum recommendation for running *Windows 3.0*), a 100MB or slightly larger hard disk, one floppy disk drive, a VGA video controller, a tilt-and-swivel color VGA monitor, a keyboard, a mouse, and DOS 3.3 or 4.01. All the systems included floppy and hard drive controllers and at least one parallel and one serial port. With two exceptions (noted in text), all supported 16MB of fast RAM.

Manufacturers' list prices are often discounted by dealers, so to provide you with useful across-the-board cost comparisons, these reviews are based on *street prices*. For every PC, our research department gets a price quote from up to five PC dealers in each of eight cities: Boston, New York, Atlanta, Chicago, Dallas, Houston, San Francisco, and Los Angeles. Results are averaged.

ALR PowerFlex 20CSX

PROS: Fast; "extra" 286 CPU

CONS: Low ceiling for CPU-speed RAM

ALR's PowerFlex 20CSX is way fast. It rated second speediest overall and tied for top place in three out of five tests. However, its cramped 5MB ceiling on CPU-speed RAM is too low to take the system very far into the 1990s.

The PowerFlex's CPU board plugs into a special slot, which makes it easy to upgrade to a 486 by swapping boards—if you want to bother. Since a 32-bit 486 would have to access motherboard memory through the 16-bit memory bus, you wouldn't get the full benefit of the 486.

Oddly, in addition to the SX CPU, the motherboard has a 286 that's nonoperational. In the unlikely event that the CPU or processor board goes south, you can use the PowerFlex 20CSX as a 286 while you wait for a replacement.

VGA is not built into the motherboard, so you have to use ALR's VGA video board, which also holds the system's mouse port. The VGA board runs in 800 by 600 super-VGA mode.

While it has room for a healthy four drives, the PowerFlex's chassis design can be problematic. If you need to swap a drive in one of the center drive bays, you have to pull out the CPU board, any full-length expansion boards, and the

Deskpro 386s/20: Compact Outside, Roomy Inside

Compaq's Best Buy powerhouse, the Deskpro 386s/20, beats NCR's Best Buy PC386sx20 in drive and slot capacity—but you'll pay top dollar. Thanks to steep dealer discounts, NCR's unit goes for about $700 less.

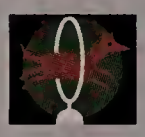
● Yes
○ No

	ALR PowerFlex 20CSX	AST Premium II 386/20	Compaq Deskpro 386s/20	Dell 320LX	NCR PC386sx20	NEC PowerMate SX/20
Standard features						
Street price[1]	$3600[2]	$3528[3]	$4279[4]	$3659	$3547	$3635
List price[1]	$4525[2]	$4870[3]	$5842[4]	$3659	$6019	$4722
80387 coprocessor support	●	●	●	●	●	●
Disk caching software	●	●	●	○	●	●[5]
Mouse port	●[6]	●	●	○	●	●
Fast-RAM capacity	5MB	16MB	16MB	16MB	16MB	12MB
Expandability						
8/16-bit slots/number free	5/4[7]	5/4	4/4	6/5	4/4	4/3
8-bit slots/number free	1/1	1/1	0/0	2/2	0/0	0/0
External/internal half- or third-height drive bays[8]	3[9,10]/1	3[9,11]/2	3[12]/2	3[9,13]/2	2[10]/1	2/1
Largest hard disk option	650MB	200MB	210MB[14]	650MB	100MB	140MB
Design and construction						
Compact footprint	●	●	●	○	●	●
Front-panel on/off switch	●	●	●	○	●	●
Reset button	○	●	●	○	●	○
Service and support						
Warranty period (months)	12	12	12	12	12	12
Free on-site service	○[15]	○[16]	●[16]	●	●[16]	○[16]
Toll-free support number	○[16]	●	●[16]	●	●[16]	○[16]
Daily support (hours)	9	11	●[16]	15	●[16]	○[16]
Weekend support	○[16]	○[16]	●[16]	●[17]	●[16]	○[16]
Electronic BBS	●	●	●[16]	●	●	●
			BEST BUY		BEST BUY	

[1] Except as noted, price based on 4MB RAM, 100MB or larger hard disk, 1.2MB 5¼-inch (or 1.44MB 3½-inch) floppy drive, VGA and color VGA monitor, at least one parallel and two serial ports (or one serial and one mouse port), 101-key keyboard, mouse, and DOS 3.3 or later version. If the vendor doesn't offer a mouse, we added $99 to the street price and $125 to the list price to represent the cost of a basic Microsoft Mouse.
[2] Includes 5MB RAM, 106MB hard disk, and 600 by 800 super-VGA color monitor.
[3] Includes 110MB hard disk.
[4] Includes 120MB hard disk.
[5] Included in Windows 3.0.
[6] On VGA card.
[7] One slot is slightly too short to hold a full-length card.
[8] Except as noted, external bays are half-height 5¼-inch, and internal bays are half-height 3½-inch.
[9] Two adjoining 5¼-inch half-height bays can hold one full-height drive.
[10] One externally accessible bay is 3½-inch.
[11] One externally accessible bay is third-height.
[12] Two externally accessible bays are third-height.
[13] All bays are 5¼-inch.
[14] 650MB using external drive chassis.
[15] Optional through Intel.
[16] Via dealer. Some variation will be found from one dealer to another.
[17] Saturday 8–4.

BUYING SMART

Even an entry-level SX needs all the power it can get to run today's (and tomorrow's) demanding applications. As with most desktop systems, the key buying criteria for a 20-MHz SX are performance, the capacity to add fast RAM, and price. Other factors include how many expansion slots are left free, how much room there is to install drives, quality of design, and quality of service and technical support.



PERFORMANCE

All the machines tested use the same 20-MHz Intel 80386SX processor, so variations in performance are clearly due to other factors, including hard disk access speed, VGA response, and the presence (but not necessarily the size) of a memory cache. You can't add a cache if one's not built-in, so if you want to goose the last millisecond of performance out of these systems, your only choices are to buy a faster VGA controller and/or a faster drive. IDE and ESDI drives are faster than old-fashioned ST-506 and MFM drives.

FAST-RAM CAPACITY

Most modern applications, including *WordPerfect, 1-2-3,* and *Paradox,* run better with several megabytes of RAM—and multitasking environments like *Windows 3.0* and *Desqview* need as much memory as you can afford to give them. Fast RAM (installed on the motherboard, or in a special high-speed slot) is best, since it runs at CPU speed—two-and-a-half times as fast as RAM mounted in a regular 8-MHz expansion slot. Look for the ability to handle a full 16MB of fast RAM. You may not need it now, but in two years you might.

EXPANDABILITY

You don't have to be a power user to want a network, a tape drive, a modem, a scanner, a fax board, or even a sound board. Since each of these enhancements may require a separate expansion board, look for a system with at least four 16-bit slots free after all the "standard" equipment (video, ports, hard and floppy drive controllers, and a mouse) is installed. Five or more free slots is even better.

While it's important for high-end desktops and file servers to have lots of drive bays, this is less of an issue for entry-level business workstations—especially since many are linked to a server with plenty of hard disk storage space. Four bays is space enough to install two floppy drives, a tape drive, and a hard disk.

DESIGN AND CONSTRUCTION

The question of what makes for good system design is often subjective. Two things everyone can agree on are that a small footprint saves desk space and a noisy system is a constant irritation. Good internal design means you should be able to add new drives or additional RAM without pulling the whole system to pieces. Good external design means easy access to the inside of the case, the floppy drives, and all important controls. An ergonomically designed keyboard with tactile feedback (or at least an audible click) is a must for heavy use.

SERVICE AND SUPPORT

You should demand at least a one-year warranty. Free on-site service is great, but it's rare. Fortunately, many dealers offer on-site service as part of a low-cost extended warranty package. Centralized, toll-free telephone support will save you time and irritation. And if you run into trouble on evenings or weekends, you'll be glad if tech support is available at those times too. If you have a modem, a tech support BBS is often the fastest way to get help.

To evaluate the quality of tech support, our tireless research staff calls central tech support numbers to find out how quickly help is given. When service and support are provided via dealers, our researchers make a random telephone survey of local dealers to find out exactly what services are offered. —*R. L.*

drives in the outboard (right-hand) bays. Installing expansion boards and the right-hand drives is a lot easier.

The PowerFlex's ergonomics are a mixed bag. The fan and hard drive are noisier than average, and the keyboard has a dead feel. One nice touch: The right-hand floppy drive is mounted vertically, making it easy to use if you prefer to stand your computer end-up on the floor to save desk space and reduce noise.

ALR relies on its authorized dealers to provide service and most support. The company offers a centralized number and a BBS for tech support, but neither call is toll free. Moreover, every time we called the tech support line we got a busy signal.

The 20CSX's performance is quite good, but who needs a 20-MHz 386SX

with a 5MB fast-RAM ceiling? When you factor in the only-fair support, you've got grounds to look for a better deal.

AST Premium II 386SX/20

PROS: Excellent expandability, CPU upgrade path, toll-free tech support

CONS: Fairly slow; clickless keyboard

AST's Premium II 386SX/20 has a lot going for it. Its $3528 street price is (by a hair) the lowest in this review, and the machine delivers excellent capacity for boards and drives. However, its performance—especially on disk-intensive tests—is disappointing. It finished last in the *Paradox* test and did nearly as badly on *dBASE*.

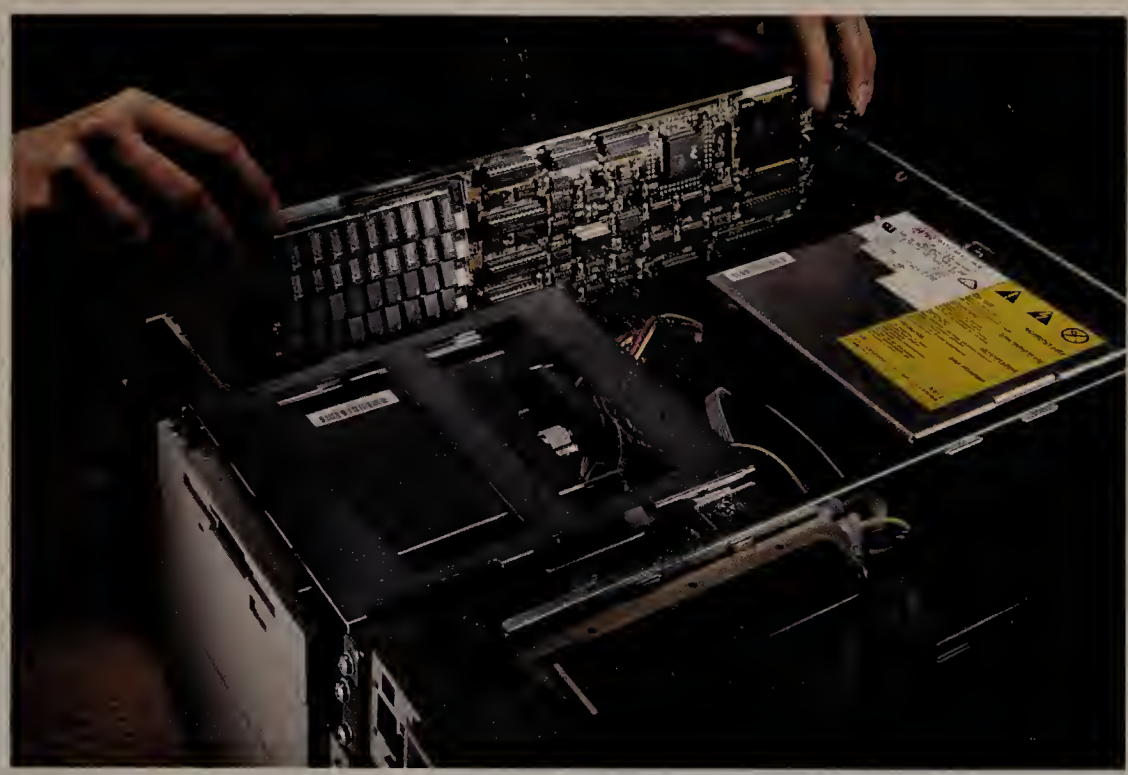
The Premium II 386SX/20 is one of the best-designed small-footprint PCs we've seen. CPU, system memory, and math coprocessor all mount on a removable CPU board, so it's easy to swap up to a 25-MHz or 33-MHz 386DX or a 25-MHz 486.

The system boasts excellent expansion capacity: You get five drive bays—a tie for the best count in the roundup—and five free slots. Thumbscrews make it easy to open and close the case, and good internal design lets you swap drives without having to remove expansion boards or other drives.

The system is appealing on the outside as well. The power switch and monitor controls are all right up front, and it's the only unit reviewed that provides a reset switch. You get not only a second serial port but a mouse port. (The other machines give you one or the other but not both.) The only minuses worth mentioning are a slightly noisy fan and a keyboard that lacks an audible click.

AST's support is commendable. The central tech support number (but not the BBS) is toll free, and all our calls were answered promptly. AST dealers provide service and all other support.

Despite its poor performance on disk-intensive applications, the AST Premium II 386SX/20 is a good entry-level system at an excellent price. Small-footprint PCs don't get much more expandable, and the AST's easy upgrade path will keep your investment paying off for years. But if data base work is your bread and butter, you can do better.



Thinking about what kind of machine you'll need in the future? So is the AST Premium II 386/20. Its CPU, fast RAM, and math coprocessor are all located on a removable board, so you can graduate to a faster system later without sacrificing your investment.

MARC SIMON

Compaq Deskpro 386s/20

PROS: Very fast, well designed, quiet

CONS: Expensive; mushy keyboard

The Deskpro 386s/20 maintains the Compaq traditions of solid construction, superb design, and outstanding performance. It took top honors in our speed tests, and its expandability is excellent. The 386s/20 also maintains a less-enticing Compaq tradition: At $4279 on the street, in the *PC World* configuration, it's about $700 more than the other systems reviewed here. But for customers who can pay the price, the 386s/20 qualifies as a clear Best Buy.

The system is well designed inside and out. Getting into the case is as simple as loosening three thumbscrews. Adding RAM or a math coprocessor entails at worst removing a board, and swapping a drive is a matter of removing one or two screws. There's even a special extension for Compaq's 1024 by 768 souped-up graphics coprocessor.

Compaq wins our praise for switching to industry-standard SIMMs instead of the custom memory modules it used in the past. This means you can shop around for market-priced RAM instead of being forced to buy Compaq's expensive memory.

The Deskpro 386s/20 is remarkably quiet. All power and monitor controls are placed conveniently at the front. However, the keyboard feels dead, and a key-press click from the speaker is no substitute for feedback from the keyboard itself.

Service and support are provided by dealers, so quality may vary; however, Compaq service is generally rated quite good. Of the dealers we surveyed, all offered phone support, but only one stayed open past normal business hours, and none offered free on-site service. All had fax machines for customers' queries.

When a company asks top dollar, you have a right to demand top performance—and that's what Compaq delivers with the Deskpro 386s/20. Speed, superior design, and fine expandability make this system the best 20-MHz PC

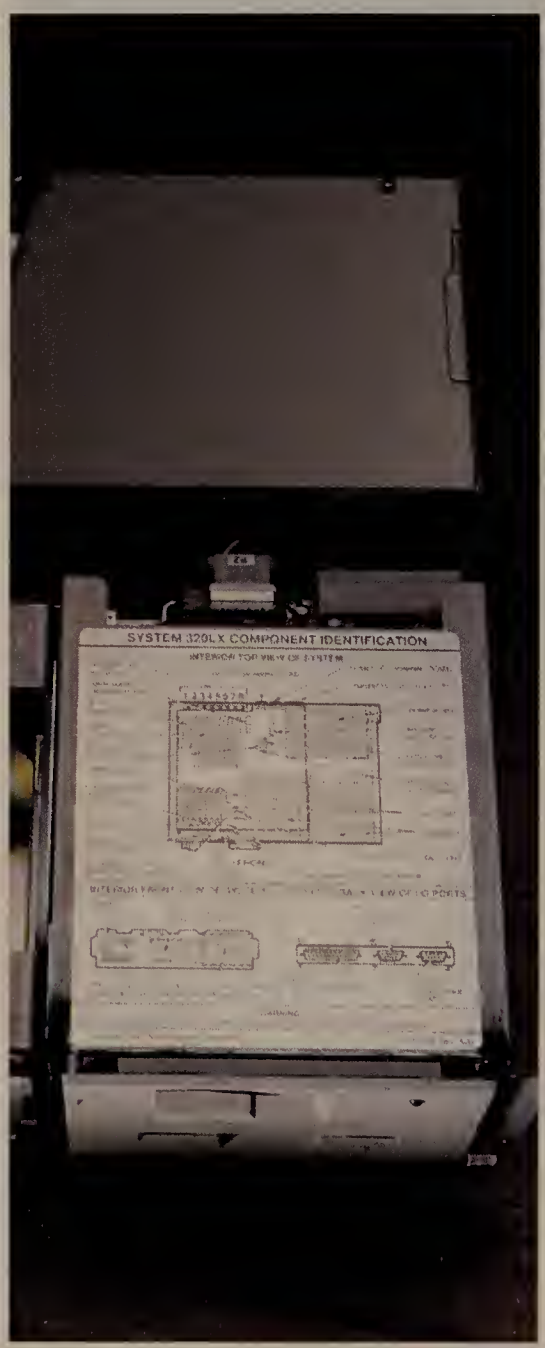
money can buy. The 386s/20's only drawback as an entry-level system is the $700 extra you'll have to pay, but for companies that can afford it, the payoff is worth the dough.

Dell 320LX

PROS: Outstanding service and support, excellent slot and drive capacity

CONS: Slow, slightly noisy

Dell's 320LX was one of the first 20-MHz boxes to hit the street. It's also the only large-footprint system reviewed, which gives it the biggest capacity for boards and drives in the roundup—but also makes it problematic for users with crowded desks. Worse, this big fella is slow on its feet: It came in last in four of the five *PC World* tests, probably due to its lack of a memory cache. Still, if you can live with less-than-stellar performance the Dell is a good choice, if for no other reason than Dell's outstanding service and support package.



When you open up your PC do you feel lost in the woods? Fortunately, you can find your way out of the wilderness with the Dell 320LX's handy internal system map. And if that doesn't work, you can turn to the best service and support in the roundup.

MARC SIMON

It's easy to find your way around inside the 320LX's roomy AT-style case. The design is clean and open, and a handy map of all components, switches, and sockets is glued to the top of the drive bays. It's a snap to slide drives in and out, and all slots can hold full-length boards. The keyboard feels great—its tactile feedback improves accuracy. The only design flaws are a noisy fan and a power switch that makes you reach around to the right side.

Dell provides all service and support—and does an excellent job of both. A year of on-site service is included in the price of the machine, and toll-free phone support is available 15 hours every weekday and 8 hours on Saturday. Dell's BBS is toll free too, as is the automated TechFax program that lets you call in and receive faxed instructions for everything from installing SIMMs to putting a low-level format on a new hard disk.

The Dell 320LX's performance is a drawback, but there's more to an SX than meets the stopwatch. The system's excellent design, expansion capacity, and price, plus Dell's top-of-the-line service and support package, make the 320LX a reasonably good choice for all but hopeless speed addicts.

NCR PC386sx20

BEST BUY

PROS: Fast, super VGA

CONS: Limited space for drives, keyboard may block flappy drive

While NCR's PC386sx20 is not the fastest system we tested, it comes close, sharing top place on the *1-2-3* and *Paradox* tests. Fast performance combined with a low street price earns the NCR the best price/performance ratio in the roundup, and it ices the cake with built-in super VGA. Despite its relatively limited drive capacity we have no hesitation about awarding it a Best Buy.

The NCR's integrated motherboard includes all the ports, drive controllers, and video chips you'll need—even a VRAM socket to upgrade the system's super-VGA capability to 1024 by 768. All four slots remain free, but the system has room for only three drives. In most cases that won't be a problem, but you'll have to choose between a second floppy and a tape drive—or use the built-in external floppy port.

For the most part, the design is solid. The fan is quiet, and you get a handy volume control for PC audio. The case is only a bit over 5 inches high, so you can fit it into tight spaces, but as a result the keyboard may block the lower floppy drive. Also, the keyboard lacks audible and tactile feedback.

NCR handles service and support via its authorized dealers. We called a random sampling and found that only a few had evening and weekend phone support or a BBS, but every dealer had a fax machine for tech questions.

NCR's PC386sx20 combines the low price, good performance, and generous fast-RAM capacity you'll need to keep your new system productive over the next five years. Super VGA is a nice fringe benefit. Unless you simply must have four or more drive bays, this is your Best Buy.

NEC PowerMate SX/20

PROS: Bundles Windows 3.0, super VGA

CONS: Naisy; limited expansion capacity

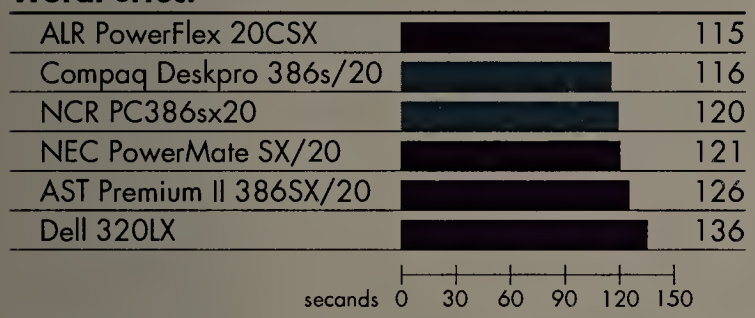
The NEC PowerMate SX/20 is the only system reviewed that bundles *Windows 3.0*—a $150 value. Despite this plus, the NEC is short on outstanding features. Performance barely rates a Good, probably because of the lack of memory

Leaders of the 20-MHz Pack: Compaq, ALR, NCR

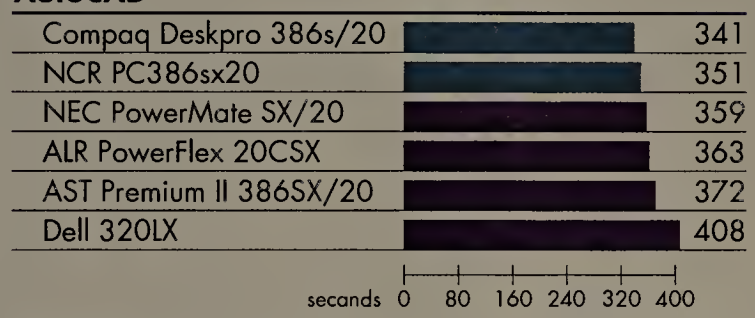
Compaq's Best Buy Deskpro 386s/20 turns in top overall scores, with ALR's PowerFlex 20CSX and NCR's Best Buy PC386sx20 close behind. The two Best Buys can access up to 16MB of RAM at full speed—a big plus for multitasking.

Best Buy

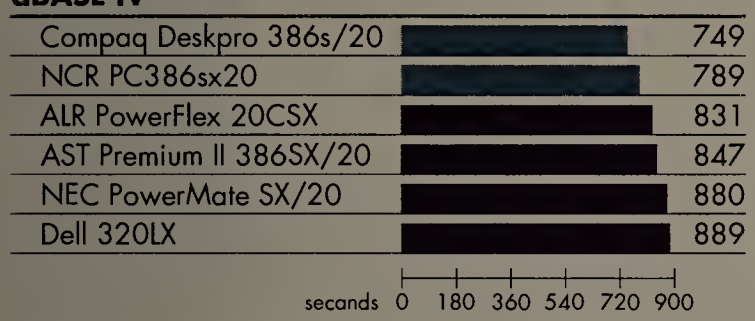
WordPerfect



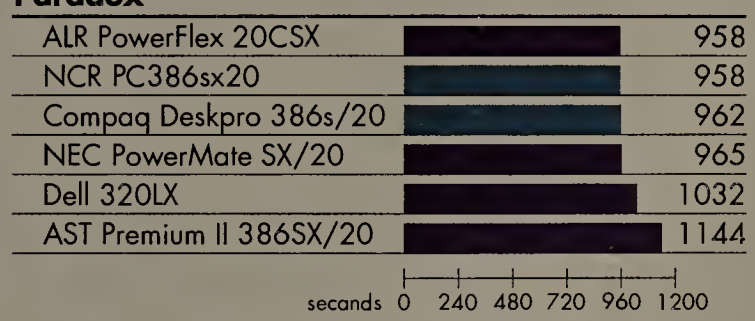
AutoCAD



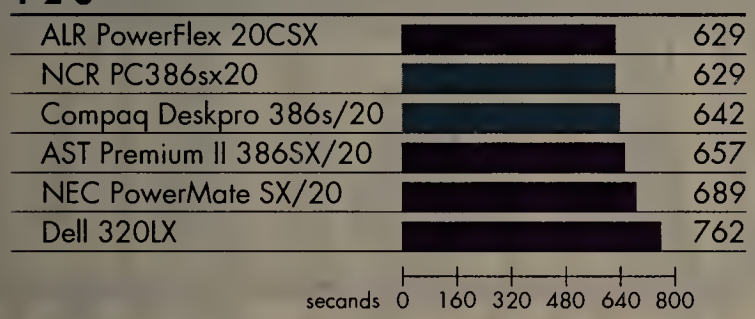
dBASE IV



Paradox



1-2-3



Methodology
All the computer systems were tested with 4MB RAM except the ALR, which had 5MB RAM. Every computer was tested with the vendar's versian af DOS, and each system had a 100MB hard disk except the ALR (106MB), AST (110MB), and Campaq (120MB).

WordPerfect
This test measures the time required to refarmat three *WardPerfect 5.0* dacuments that vary in size fram 5K ta 55K. The files are basic text with same baldface and underlined text; ane af the dacuments includes a TIFF image.

dBASE IV 1.0
This test measures the time required to camplete an unindexed search far a single recard in a 100,000-record parts table. Then the table is indexed, the transactian pracessing madule is run, and 600 records are pasted.

1-2-3
The *1-2-3 2.2* test measures the time required ta camplete the fallawing aperatians. The applicatian is laaded. Then three separate warksheets (arithmetic, financial, and scientific) are laaded, and varians chonges are made and recalcs run an each. Subsequently the *MAPS* add-in fram Management Advisary Services af Seattle is used to run a number af financial farecasts.

AutoCAD
AutaCAD release 10 laads a 500K drawing, masks layers, changes zaams, and remaves the hidden lines.

Paradox
Starting with an arders toble, each recard is campared with on available stack table, where the current price far the item is faund, and the resulting recard is inserted inta an invaice table.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

caching. Expandability is below the mean, and while the system's 12MB limit for fast RAM is acceptable, it's also below average for this roundup.

The PowerMate is packed with custom boards, each fashioned to fit into its own dedicated slot on the motherboard. The CPU and math coprocessor are on one of those boards, but there's no upgrade option. Other proprietary boards provide an 800 by 600 super-VGA adapter and RAM expansion.

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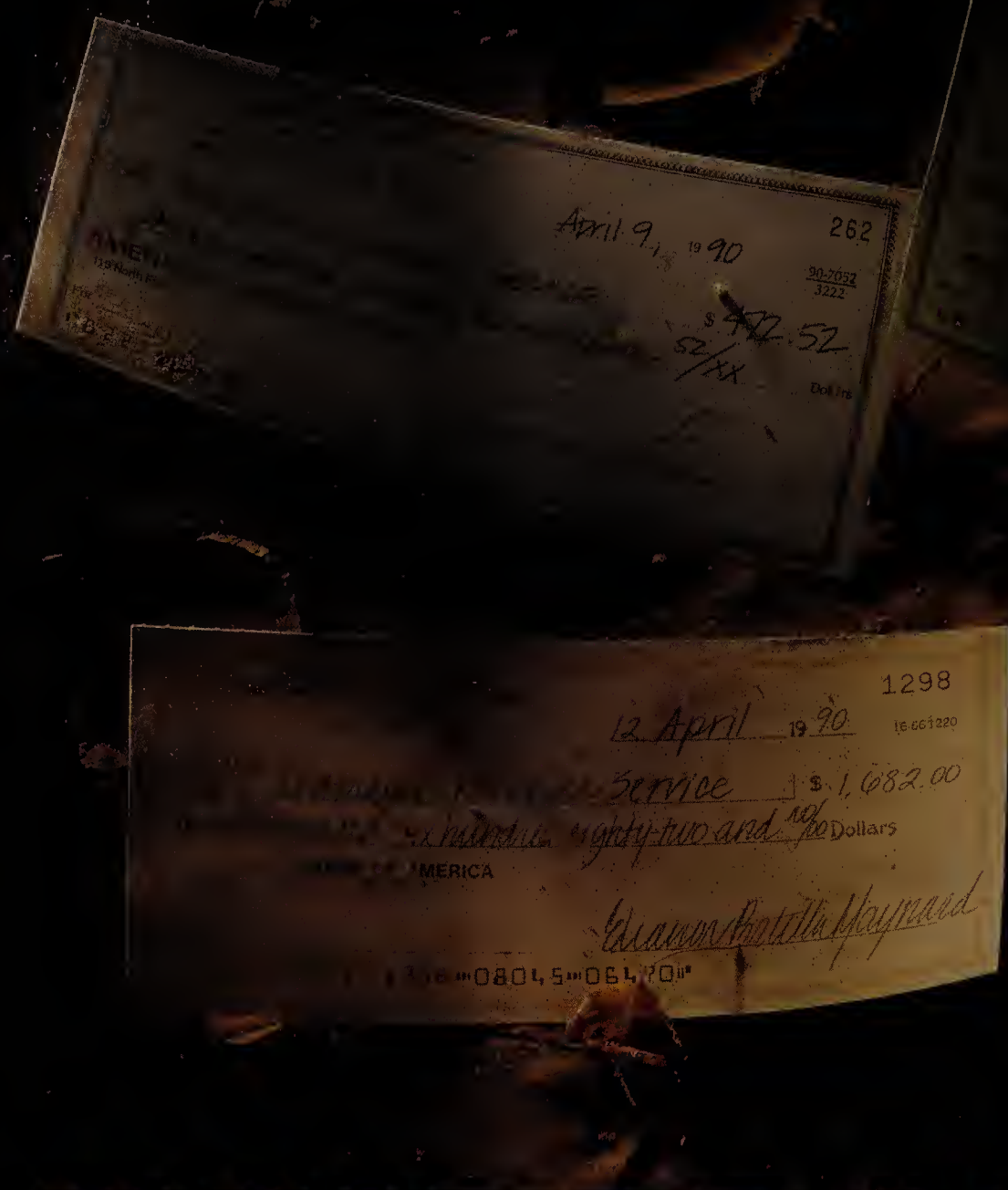

WHOEVER SAID IT
THAN TO RECEIVE WAS

It's better to give than to receive, but there comes a point when paying taxes, that even the most generous among us must draw the line.

Say hello to TurboTax.® The tax preparation software for the IBM® PC and Macintosh® that's just what you'll need to help you draw that line.

It's the software with quite an impressive track record. It has won the PC Magazine Editor's Choice Award. And the PC World World Class Award for 5 years in a row.

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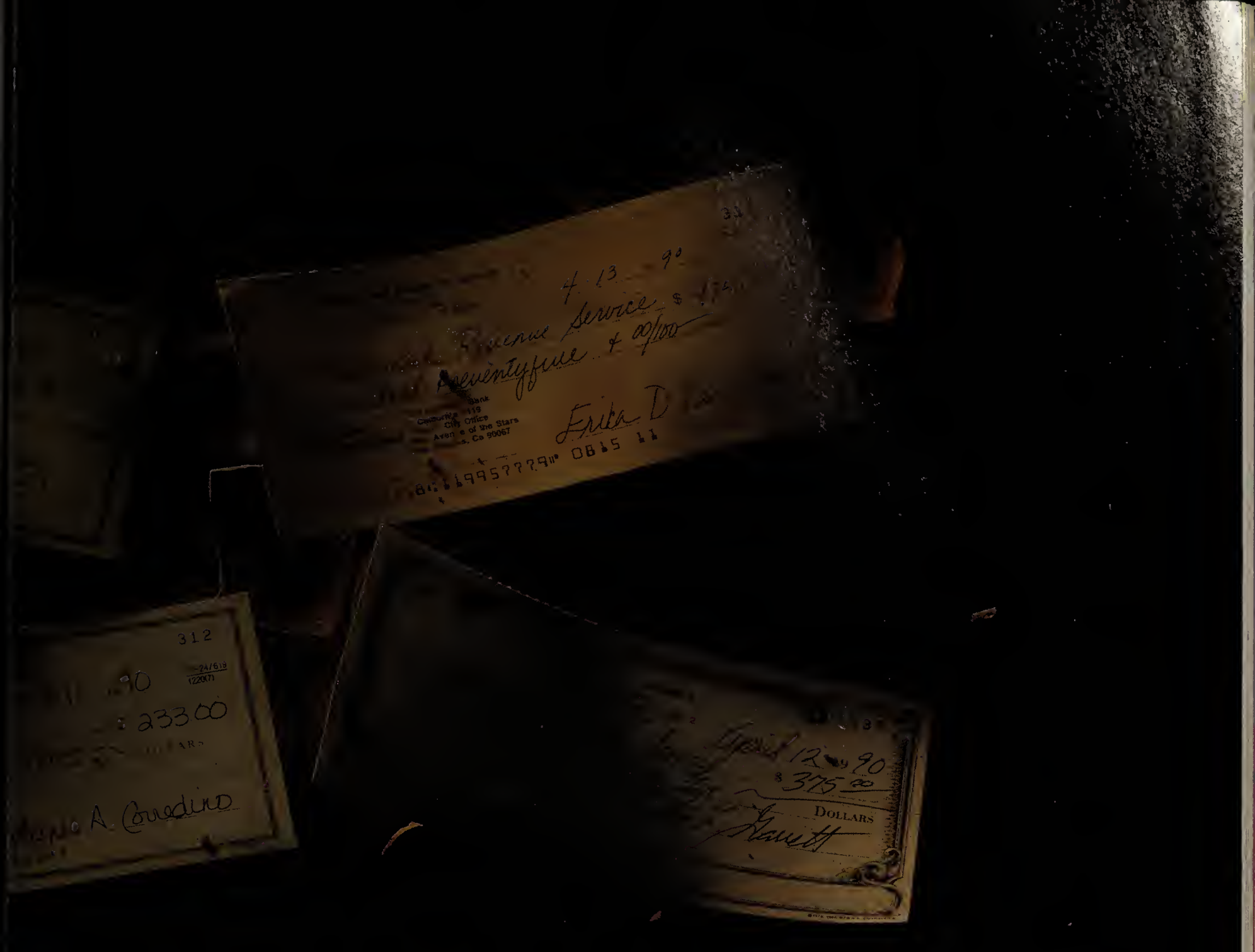
It lets you compare various tax scenerios. Juggle the figures. Move around deductions. Declare a stock loss this year? No, next year would be even better.

TurboTax guides you to the appropriate line, and shows you how to enter over 90 types of income and expenses. It warns you if any of the numbers you're claiming might flag the IRS. It will proof your return in over 250 areas to check for mistakes in logic, calculation, and identify any potential missed savings opportunities.

It's even a math whiz. All the



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calculations are done for you in under 5 seconds. TurboTax can print out graphics quality forms on most dot matrix and laser printers. Then, just sign your return and mail it in right off your computer.

And when you buy our software for around $75 the first year, you can update TurboTax every year after at half price.

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Ask about the family of ChipSoft products including 44 Interfaceable State Programs and our Electronic Filing Software.

You'll find out why more than 3 million returns were prepared with TurboTax last year alone. Or, for that matter, why more PC users use TurboTax than any other tax software.

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A run for your money.

Circle 44 on reader service card

EXECUTIVE SUMMARY

The Basic Business Workstation Hits 20 MHz

Windows-class performance at yesterday's prices can be yours with a 20-MHz SX.

Now that 20-MHz SXs have arrived, there's little reason to buy anything less. Most average 34 percent faster than 16-MHz units and cost only a little bit more.

BEST BUY

Two systems rated a Best Buy. The top-performing **Compaq Deskpro 386s/20** is a tempting machine in every respect—for those who can afford it. With both machines fully configured, the **NCR PC386sx20's** street price runs about $700 less than the Deskpro's, even though it boasts the same 16MB RAM capacity and performance nearly as impressive.

	ALR PowerFlex 20CSX	AST Premium II 386SX/20	Compaq Deskpro 386s/20	Dell 320LX	NCR PC386sx20	NEC PowerMate SX/20
Performance	Good	Fair	Excellent	Fair	Good	Good
Fast-RAM capacity	Fair	Excellent	Excellent	Excellent	Excellent	Good
Expandability	Excellent	Excellent	Excellent	Excellent	Good	Fair
Design and construction	Fair	Excellent	Excellent	Good	Good	Fair
Service and support	Fair	Good	Good	Excellent	Good	Good
Price	Excellent	Excellent	Good	Excellent	Excellent	Excellent
Overall value	Good	Good	Excellent	Good	Excellent	Good
			BEST BUY		BEST BUY	
Reader service no.	655	656	657	658	659	660

How we rate 20-MHz 386SX systems
We rate these systems based on information in the Features Evaluation and the PC World Test Report, combined with our opinions of quality, reliability, and user benefit.

Performance is the key to productivity with *Windows*. How quickly data appears in an on-screen window is affected by CPU, video controller, and disk drive characteristics. The standard deviation of the PC World Test Report benchmarks determines the ranges for Executive Summary ratings.

Fast-RAM capacity refers to the amount of CPU-speed RAM you can install on the motherboard and in any special fast slot. To earn an Excellent rating, a system must accommodate at least 16MB of fast RAM.

Expandability applies to the number of free slots and the number and density of mass storage devices supported. To receive an Excellent rating, a 20-MHz SX system must have at least four slots open, plus room for two floppy drives, a tape drive, and a total 300MB of hard disk storage.

Design and construction covers a variety of features: small footprint, careful manufacture, quiet fan and hard drives, easy access to controls, easy access to the inside of the case, and a good keyboard. An Excellent rating is awarded to systems that deliver most of these features.

Service and support includes the length of warranty and the quality and availability of phone support, documentation, support hours, and other support services. At least one year's full warranty, free on-site service, toll-free tech support, long support hours, and prompt, effective response are required to earn an Excellent rating.

Price ratings are based on street prices. For this first batch of 20-MHz SXs, we gave an Excellent rating to all but the Compaq unit, since on the average these systems cost very little more than comparably configured 16-MHz SXs.

Overall value combines all the above criteria, with extra weight given to performance, price, and fast-RAM capacity.

There's a built-in IDE controller, but until NEC delivers IDE drives you'll need a separate controller. The company promises to ship the drives by the time this issue goes to press, but for now we count only three free slots. Another potential problem is that you're limited to three drive bays.

External design is mixed. Keyboard and mouse ports, the on/off switch, and all controls for the monitor (the popular NEC 2A) are right up front where they belong. But the lower drive bay is so low that it can't clear the back of the keyboard, and the fan and hard drive are noisier than average. And while the keyboard has good tactile feedback, the <Ctrl> and <Alt> keys are so close together that you're likely to make more mistakes than usual.

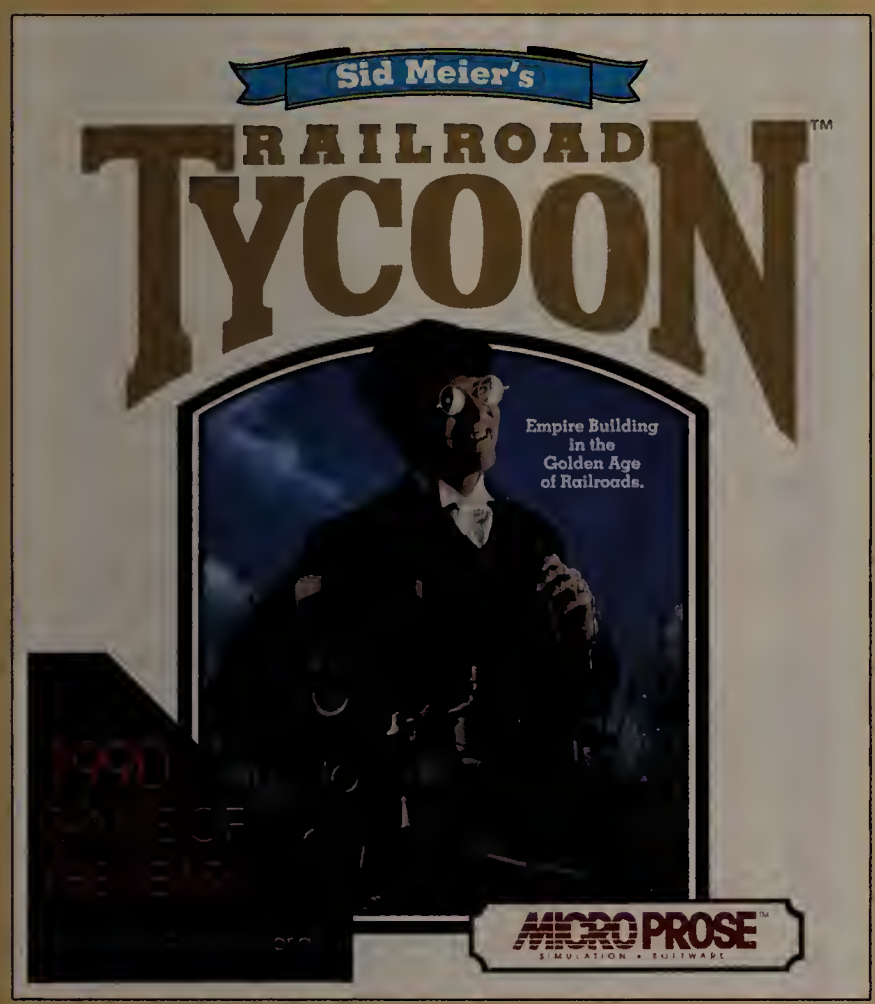
There's a central tech support BBS, but it's a toll call. Otherwise, service and support are handled via NEC's dealer network. All those surveyed had fax machines, but only one offered weekend phone support.

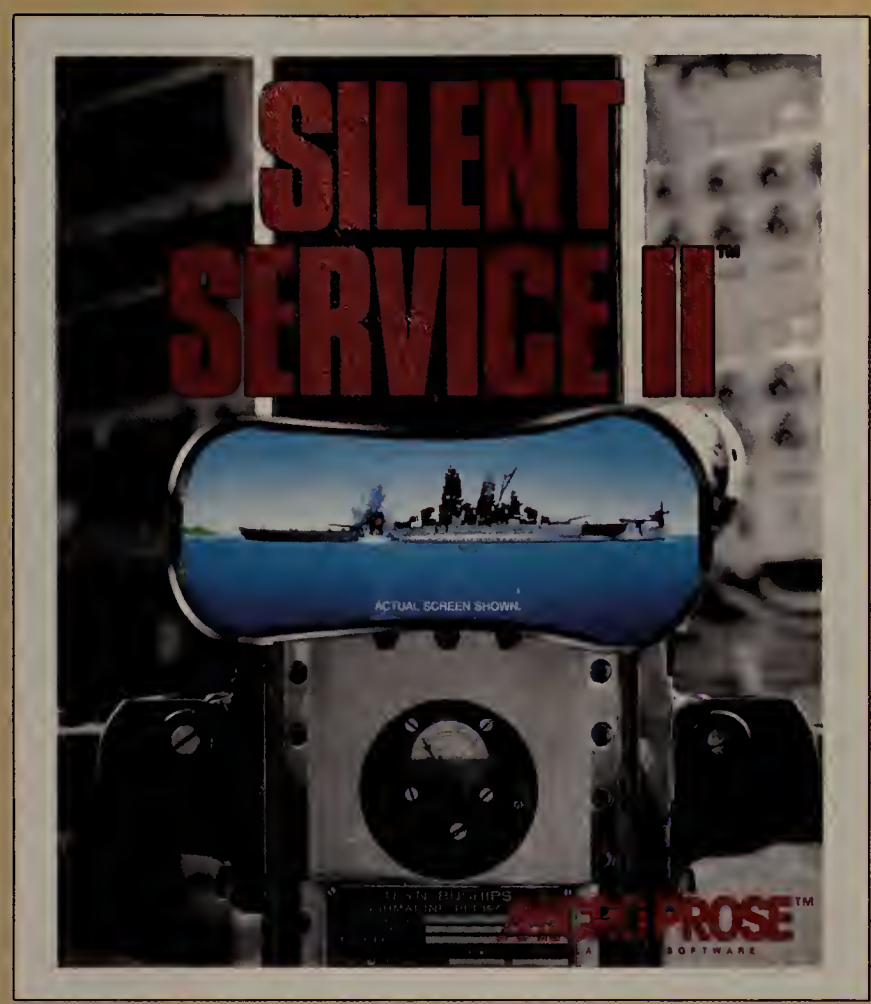
The PowerMate SX/20 is a usable PC, and with prices for these systems being so close, saving $150 on the free copy of *Windows* is a big plus. Still, other choices offer better value.

A New SX Standard

Even the least appealing of these new 20-MHz SX machines put the best of their 16-MHz predecessors to shame—

The Best of Times





America's hot new best-seller takes you on a trip through the golden age of railroading in America and Europe. Compete with famous rail barons. Plan, build, operate, maintain and expand your railroad into a mighty industrial machine.

1990 brings phenomenal new graphics and game play to the World War II submarine game that won Simulation of the Year honors around the world in 1986. Stalk Japanese ships through the Pacific from Pearl Harbor to VJ Day.

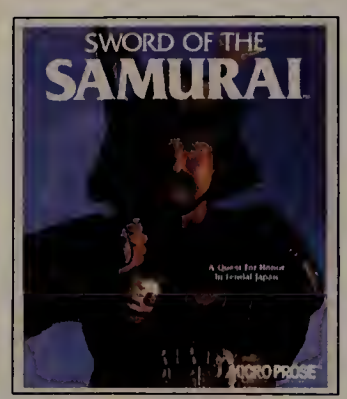
Now for Amiga!

The Software Publishers Association named this one Simulation of the Year. Engrossing game play. Fascinating strategies. Revolutionary graphics. Based on America's radar-elusive jet.

Now for Amiga!

Command not just one tank, but a full platoon of four with controls so smooth they put single-tank games to shame. Call in jets, helicopters, artillery and infantry support, too.

Dogfighting is the name of this game. No experience? No problem: just turn on all the rookie options and you'll be up to your eyeballs in dazzling graphics and furious fun.



Discover the game that has the critics raving. Fight and scheme your way to power and prestige in a role-playing/action/adventure of war and politics in 16th Century Japan.

Now for Amiga!

Take on shrewd Russian commanders in a gripping game of nuclear submarine strategy. Find and destroy the enemy with the latest sonar and weapons. Based on Tom Clancy's novel.

All games for IBM-PC. Red Storm and F-19 also for C-64. To order call 1-800-879-PLAY, Monday thru Friday 8:30am–5:30pm Eastern. ©1990 MicroProse.

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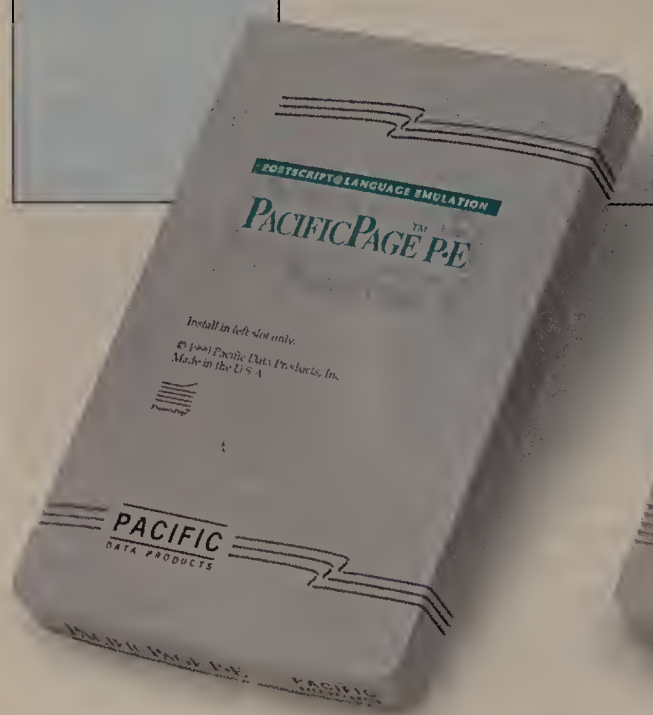
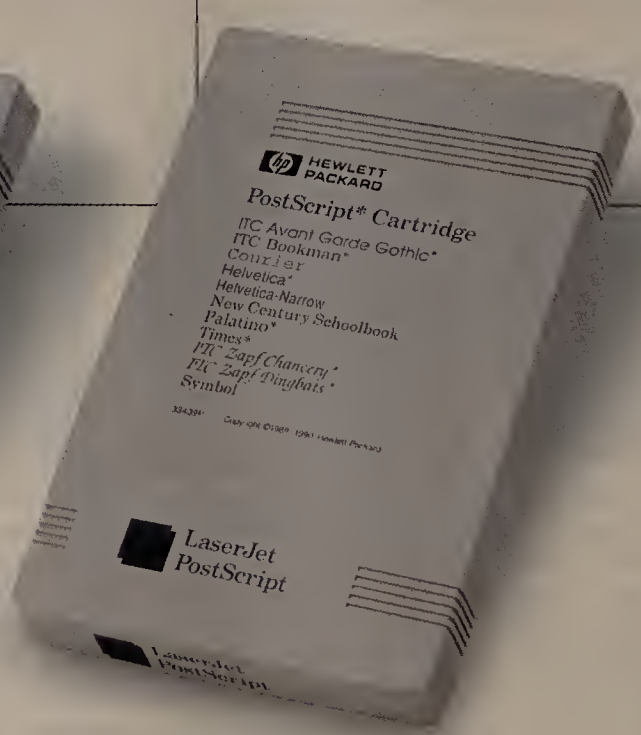
There's more to comparing LaserJet PostScript® Language Emulation Cartridges than just the name

	Pacific Data Products PacificPage™ P•E	Hewlett-Packard PostScript® Cartridge
Price	**$499**	**$695**
Emulation switching	**Yes**	**No**
Font cartridge option	**Yes**	**No**
Upgrade program	**Yes**	**No**
Warranty	**Lifetime**	**One Year**





Don't settle for less just to buy the HP name. Ask for Pacific Data Products' **PacificPage P•E**. It's the PostScript language emulation cartridge for HP LaserJet IIP, IID, III and IIID printers that offers you more for less.

Compare its lifetime warranty, upgrade program for keeping current with the latest version, and ability to switch between PostScript and PCL language emulation modes. And compare the optional companion cartridge, PacificType.

There is also an option available for connecting your PacificPage P•E equipped printer to a Macintosh computer.

To learn how you can get more for less, call your nearest dealer or contact: Pacific Data Products, 9125 Rehco Road, San Diego, CA 92121, **(619) 597-4637**, Fax (619) 552-0889.

PACIFIC
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Born to do Windows, NEC's PowerMate SX/20 bundles in the graphical environment for free and gives you built-in super-VGA video support so you can show off Windows colors in style.

MARC SIMON

and our Best Buys, Compaq's Deskpro 386s/20 and NCR's PC386sx20, take the virtues of the hot 20-MHz SX chip to the max. Compaq's Deskpro is pricey, but it's also impressive, and it boasts blazing speed. NCR's PC386sx20 combines fleet performance and low price for the best price/performance rating in our roundup.

If your favorite brand isn't represented here, just wait. An avalanche of 20-MHz SX systems is about to hit the PC marketplace, and by the time you read this every major manufacturer will probably offer one. In a few months, we'll take a look at how the second wave of 20s stacks up. So stay tuned.

PC World *contributing editor Robert Lauriston is a computer consultant specializing in local area networks.*

Rex Farrance and Susan Lusty contributed research to this article.

For more information about all products in this article, circle reader service no. 901.

WHERE TO BUY

ALR PowerFlex 20CSX
Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
800/444-4257,
714/581-9240 (fax)
LIST PRICE: Model 1 with 1MB of RAM, 1.44MB floppy drive, one parallel and one serial port, 101-key keyboard $1749; Model 40 same as Model 1 except with 3MB RAM, 40MB hard disk, 800 by 600 super-VGA adapter with mouse port and mouse $2549; Model 110 same as Model 40 except with 106MB hard drive $3349
ACCESSORIES: 1MB RAM $199; 40MB IDE hard disk $499, 80MB IDE hard disk $849, 150MB ESDI hard disk $1800, 340MB ESDI hard disk $2590, 650MB ESDI or SCSI hard disk $4490; 1.44MB floppy drive $175, 1.2MB floppy drive $175; floppy drive mounting kit $75; 150/250MB tape drive $1100; 20-MHz 80387 coprocessor $710; monochrome graphics adapter with parallel port $100, 800 by 600 super-VGA graphics adapter with mouse port and mouse $399; 12-inch TTL monochrome display $125, 14-inch 800 by 600 super-VGA color display $699; DOS 4.01 $79
WARRANTY: one year parts and labor, carry-in to ALR or Intel
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: voice and fax toll numbers, M–F 8–5
OTHER SUPPORT: in-house BBS
Reader service no. 655

AST Premium II 386SX/20
AST Research Inc.
16215 Alton Pkwy.
Irvine, CA
92713-9658
714/727-4141,
714/727-9363 (fax)
LIST PRICE: Model 3V with 2MB of RAM, 1.44MB floppy drive, one parallel and two serial ports, one mouse port, VGA on the motherboard, 101-key keyboard $2595; Model 5V same as 3V with 5¼-inch 1.2MB floppy drive $2595; Model 43V same as 3V with 40MB hard disk $3195; Model 113V same as 3V with 110MB hard disk $3695
ACCESSORIES: 1MB RAM $130, 4MB RAM $700; 40MB hard disk $700, 110MB hard disk $1250, 200MB hard disk $1950; 1.44MB or 1.2MB floppy drive $150, 40MB tape drive $695; 14-inch VGA monochrome display $225, 14-inch VGA color display $695, 14-inch 1024 by 768 super-VGA color display $745; DOS 3.3 $95, DOS 4.01 $125, OS/2 1.1 $340
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: toll-free number, M–F 6–5
OTHER SUPPORT: in-house BBS
Reader service no. 656

Compaq Deskpro 386s/20
Compaq Computer Corp.
P.O. Box 692000
Houston, TX
77269-2000
800/231-0900
LIST PRICE: Model 1 with 2MB of RAM, 3½-inch 1.44MB floppy drive, one parallel and one serial port, one mouse port, VGA on the motherboard, 101-key keyboard $2799
ACCESSORIES: 1MB memory module $299, 2MB memory

(continues)

WHERE TO BUY

(continued)
module $599, 4MB memory module $1199; 40MB hard disk $899, 120MB hard disk $1999, 210MB hard disk $2999, fixed disk expansion unit with 300MB hard disk $6399, fixed disk expansion unit with 650MB hard disk $9399; 1.44MB, 360K, or 1.2MB floppy drive $275; 60MB tape drive $799, 150/250MB tape drive $1999; 20-MHz 80387 coprocessor $999; 14-inch monochrome display $299, 14-inch VGA color display $699; DOS 3.31 $120, DOS 4.01 $150, OS/2 1.1 $340, OS/2 1.21 $340
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: via dealer
OTHER SUPPORT: none
Reader service no. 657

Dell 320LX
Dell Computer Corp.
9505 Arboretum Blvd.
Austin, TX
78759-7299
800/426-5150,
512/338-8700 (fax)
LIST PRICE: with 1MB of RAM, 3½-inch 1.44MB or 5¼-inch 1.2MB floppy drive, one parallel and two serial ports, 101-key keyboard $1801
ACCESSORIES: 1MB RAM $99, 2MB RAM $199, 4MB RAM $399, 8MB RAM $799; 40MB IDE hard disk $399, 80MB IDE hard disk $599, 190MB IDE hard disk $999, 330MB ESDI hard disk with controller $1799; 1.44MB, 360K, or 1.2MB floppy drive $99; 40MB internal tape drive with adapter $379, 40MB external tape drive with adapter $429, 150/250MB internal tape drive with adapter $799; 20-MHz 80387 coprocessor $299; VGA adapter $199; 14-inch monochrome display $349; 14-inch VGA color display $599, with adapter $699; serial mouse $59.95; DOS 3.3 $99.95, DOS 4.01 $119, OS/2 1.1 $299
WARRANTY: one year parts and labor, free on-site service
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: toll-free number, M–F 6–9, Sat. 8–4
OTHER SUPPORT: in-house BBS
Reader service no. 658

NCR PC386sx20
NCR Corp.
Workstation Products Division
1601 S. Main St.
Dayton, OH 45479
800/541-3333
LIST PRICE: Model 3304-0205 with 2MB of RAM, 5¼-inch 1.2MB floppy drive or 3½-inch 1.44MB floppy drive, one parallel and two serial ports, 1024 by 768 VGA on the motherboard, 101-key keyboard $2995; Model 3304-0210 same as Model 3304-0205 with 40MB hard disk $3695; Model 3304-0215 same as Model 3304-0205 with 100MB hard disk $4295
ACCESSORIES: 2MB RAM $750; 40MB hard disk $799, 100MB hard disk $1300; 1.44MB or 1.2MB floppy drive $200; 80/120MB tape drive $800; 256K video RAM upgrade $195; 12-inch VGA monochrome display $250, 14-inch VGA color display $699; Microsoft Mouse $150; DOS 4.01 $150, OS/2 Standard Edition 1.2 $325, OS/2 Extended Edition 1.1 $750, Windows 3.0 $150
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: via dealer
OTHER SUPPORT: in-house BBS
Reader service no. 659

NEC PowerMate SX/20
NEC Technologies, Inc.
1414 Massachusetts Ave.
Boxborough, MA
01719
800/632-4636
LIST PRICE: with 2MB of RAM, 3½-inch 1.44MB or 5¼-inch 1.2MB floppy drive, one parallel and one serial port, one mouse port, DOS 3.3, GW BASIC, Windows 3.0 $2349
ACCESSORIES: 2MB RAM $499, 2MB CPU-speed RAM plus unpopulated 8MB CPU-speed RAM expansion board $499; 42MB hard disk and controller $800, 100MB hard disk and controller $1700, 140MB hard disk and controller $1900; 1.44MB floppy drive $199, 360K floppy drive $300, 1.2MB floppy drive $199; 60MB tape drive $695, 150MB tape drive $1399; 20-MHz 80387 coprocessor $849; VGA adapter $250, 1024 by 768 VGA adapter board $999; NEC MultiSync 2A color VGA display $799; DOS 3.3, GW BASIC $130, DOS 4.01 $130, OS/2 1.1 $325, Windows 3.0 $195
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: via dealer
TECHNICAL SUPPORT: via dealer
OTHER SUPPORT: in-house BBS
Reader service no. 660

POWER TIP NO. 162

Living With Windows 3.0 Color

If you want to create custom colors for *Windows 3.0*, try experimenting with the color settings. Open the Color utility from the Control Panel, and select *Color palette Define custom colors* to display all the colors that *Windows 3.0* can use. Now you have several options. Change Saturation (labeled 'Sat:') to the maximum value of 240 for fully saturated colors, and then change Luminance to 120. This last setting gives rich colors halfway between white (Lum:240) and black (Lum:0). Now change Hue to 0 for pure red. Add 40 to Hue to produce yellow. As you keep adding 40 to Hue, you see each pure color up to 240 (which actually brings you back to 0, or red). Once you've selected a true color, select an empty custom-color box, and choose *Add color* in the Custom Color Selector. Once you've added the color to the box, you can use it for scroll bars, window frames, and other display items.

Brian Livingston
New York, New York

When choosing a personal computer, there are two questions you should ask.

Why FastData?

A personal computer is a large investment; before you choose, we want you to know what to expect when you purchase a FastData personal computer from FastMicro.

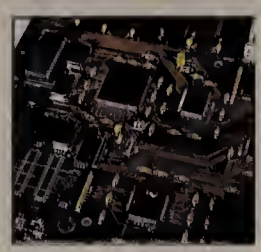
Superior Design.

You get more out of your FastData personal computer because we put more into it. We've been building PC's longer than most of the competition and we put that experience to work for you. We use proven designs that pass our stringent performance requirements and compatibility standards so it will be sure to pass yours.

Full Support.

Our team is standing by and ready to make your FastData computer perform to its greatest potential for you. When you buy a FastData computer, you're covered by Toll-Free technical support for life. And since we sell more software than other computer companies, we are uniquely qualified to give the proper support the customer deserves.

Better Components.



The whole is only as good as the sum of its parts; and FastData systems use some of the best parts in the industry. For example, each FastData system ships with a Keytronics keyboard; Keytronics costs a lot more than others, but the quality is worth it.

Our systems use exclusively Toshiba floppy drives, the industry leader. Standard equipment includes other quality components from Western Digital, Phoenix, Chips & Technologies, just to name a few.

Service.

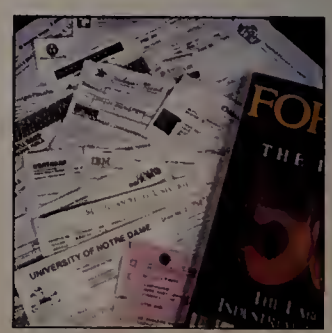
All FastData personal computers come with a full one year warranty, but that's just the start. In the unlikely event your computer is down, it is our goal to get back up and working as quickly as possible - and we back it up with action. Call us toll-free and we'll work with you to determine the problem; if a part breaks, we will send you the replacement part through our FastSHIP program - before the broken part is returned to us - and we'll pay the freight both ways. If our phone support or FastSHIP program can't solve your problem, we will service it on-site to most U.S. locations or replace your computer at no charge. Now that's service.

Selection.

Our face to face retail background has made us never forget that the customer comes first and that a personal computer is just part of a customer's overall needs. That's why FastMicro offers thousands of hardware and software products to enhance your new personal computer. In fact, our competition will probably tell you to call us when you need something to run on their personal computer.

Risk Free.

We pass the test for the choosiest of customers; in fact, FastMicro sells to over half of the Fortune 500 and Universities in 47 states (we're working on the rest). These people buy for a living and rely on us, you can too. You can do more than take our word on it - go ahead and purchase any FastData brand product from FastMicro and if you are not thoroughly satisfied after 30 days, you can return it for a full refund of the purchase price.



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Which FastData?

$1499 FastData 386/SX

Combine the benefits of an advanced Intel 386 processor, the value of a 286 and the advantages of FastData and you've got the FastData 386/SX! This machine is the choice of those who want to run today's powerful 386 and multitasking software, like Windows, and want to rip through their favorite programs, like Lotus and WordPerfect at blinding speeds. This machine is ideal to run the latest memory demanding and graphic software, right out of the box. We've made our customers' favorite options standard: it comes with an ample two megabytes of memory, a high performance 40mb hard drive, and 16 bit color VGA. Compare performance, features, and service and you will find no better SX value. Interested further? Try the FastData 386/SX for 30 days; you have to be happy - if not, we'll take it back.

Standard Features

- ✓ 16mhz Intel 80386-SX processor. (20mhz optional)
- ✓ 2 megabytes of zero wait-state RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive. (Second drive add $79)
- ✓ Standard chassis with keylock, speed and reset buttons. (Optional chassis add $50)
- ✓ Five available drive bays.
- ✓ 200 watt power supply
- ✓ 14" VGA color monitor with 16 bit VGA card with 256K.
- ✓ Clock calendar, parallel port, and two serial ports. (Game port included on color systems)
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 available.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ Compatible with DOS, OS/2, Windows, Xenix and Novell.
- ✓ FCC Class B approved.

System Price	40mb	65mb	80mb	100mb
Monochrome	$1,199	$1,269	$1,399	$1,469
VGA Color	$1,499	$1,569	$1,699	$1,769
VGA 1024	$1,599	$1,669	$1,799	$1,869

FastData 386/25 $2099

The optimum combination of features, expandability, and power make the FastData 386/25 an ideal choice for those whose applications demand the most from a computer. Whether running as a network fileserver, CAD or graphics station, or power-user's workhorse, the FastData 386/25 handily meets the challenge. It comes configured with a whopping four megabytes of fast RAM, a superfast 22 millisecond 65 megabyte hard disk, and maximum VGA displaying 1024 by 768 resolution powered by a high-output 16 bit 512K VGA board. Plus, the FastMicro team will configure your FastData 386 exactly the way you want, without sending you shopping elsewhere. When evaluating 386-DX workstations, why even consider anything else?

Standard Features

- ✓ 25mhz Intel 80386-DX processor. (33mhz optional)
- ✓ 4 megabytes of zero wait-state RAM.
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- ✓ Standard chassis with keylock, speed and reset buttons.
- ✓ Five available drive bays.
- ✓ 80387-DX coprocessor socket.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, and two serial ports. (Game port included on color systems)
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 available.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ Compatible with DOS, OS/2, Windows, Xenix and Novell.
- ✓ FCC Class B approved.

System Price	65mb	80mb	100mb	200mb
Monochrome	$1,699	$1,829	$1,899	$2,299
VGA Color	$1,999	$2,129	$2,199	$2,599
VGA 1024	$2,099	$2,229	$2,299	$2,699

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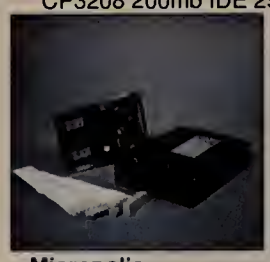
CP3208 200mb IDE 25ms 849



Mitsubishi 60mb AT Kit

$349 RLL encoding, 1:1 controller, and 22ms access time make this a quick performer. The perfect upgrade for your 286 or 386 compatible, this kit comes with everything you need including controller and cables.

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Impulse 42mb 12 ms 16bit IDE Kit 399
Impulse 105mb 9 ms 16bit IDE Kit 599

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$79

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80MB AT ST296N SCSI Drive w/adaptor 349
89MB ST1102A 19ms IDE Drive 419
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210MB ST1239A 15ms IDE Drive 799
330MB ST2383E 16ms ESDI Drive 1289
Teac
720K 3.5" Floppy 59
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1.44MB 3.5" Floppy 65

Toshiba 100mb IDE Kit

$549

Upgrade your 286 or 386 to IDE technology and Toshiba quality at a FastMicro price. This kit comes with a fast 20ms 105mb drive and built-in 1:1 controller, 16 bit IDE card with dual floppy controller and cables, 5.25" brackets and rails. Call our experts for all your drive needs. Model MK234FC.

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1.2MB 5.25" Floppy 69
1.44MB 3.5" Floppy 69
65mb MK134 22ms RLL drive 279
100mb MK234FC IDE 3.5" drive 499
Western Digital Disk Controllers (also see FastData)
WD 16 bit IDE Host - No Floppy/With Floppy 39/49
WD1006V-MM2 MFM AT 1:1 Controller 79
WD1006V-SR2 RRL AT 1:1 Controller 89
WE1007V-SE2 ESDI AT 1:1 Controller 149

Panasonic Super VGA

$439 The Panasonic C1381 will do VGA up to 1024x768 interlaced resolution. It has a dot pitch of .28 and is compatible with all standard VGA cards. Includes swivel base and VGA cable.

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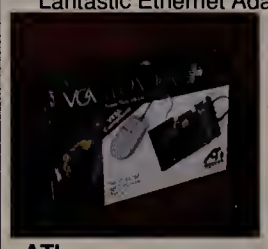

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$189

New and improved, the ATI VGA *WONDER+* is faster than VRAM. It does interlaced and non-interlaced 1024x768 modes, is 100% register compatible, and comes with extensive software drivers. A free mouse is included as an added bonus. 512K version $219.

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VGA 1024 256K/512K 175/199

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This external modem features V.42 and MNP error correction combined with MNP/5 and V.42 bis data compression to provide total high speed throughput. The PM9600SA is also V.32 TCM, V.32, V.22 compliant and comes with a five year guarantee too.

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2400B Int with MNP 169
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Promodem 2400G External 149
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Lancard/A PC (Arcnet) 75
Lancard/E Star 8 (Ethernet) 139
Lancard/E AT (16 bit Ethernet) 249
USRobotics
2400 Baud Internal 119
2400 Baud External 147
Courier HST 14,400 Ext. 579
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The FastData 16 bit VGA card features 256K of video memory, does CGA, EGA, & VGA up to 1024x768 and comes with drivers for popular software including Windows 3.0. It's expandable to 512K and has a 30 day money-back guarantee.

$95 256K Vers.
$125 512K Vers.

FastData 16bit 1mb VGA 169
FastData CGA Card 35
FastData MGP Card 29

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$69 The FastData 2400 baud internal modem is fully Hayes compatible and can be configured to COM port 1-4. It has an internal speaker, is auto answer & auto dial, and comes with BitCom software.

9600B SendFax w/ 2400B Modem 99
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Parallel/Dual Serial/Game Card 29
RLL 16bit 1:1 Hard/Floppy Disk Cont. 69
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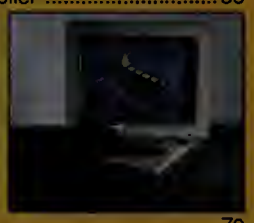
FastData Monitors



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- ✓ 12mhz 80286 processor.
- ✓ 1 megabyte RAM.
- ✓ 40 mb 28ms hard disk 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive
- ✓ Standard chassis (shown with optional chassis - $50)
- ✓ Five drive bays.
- ✓ 200 watt power supply.
- ✓ *287XL* coprocessor socket
- ✓ Monochrome monitor with monochrome graphic board.
- ✓ Clock calendar, parallel port, and two serial ports.
- ✓ Keytronics enhanced 101 keyboard.
- ✓ 8 expansion slots, 6 available.
- ✓ Full documentation.
- ✓ FCC Class B approved.

System Price	40mb	65mb	80mb	100mb
Monochrome	$799	$869	$999	$1,069
VGA Color	$1,099	$1,169	$1,299	$1,369
VGA 1024	$1,199	$1,269	$1,399	$1,469

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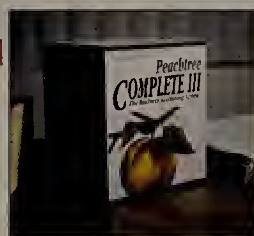

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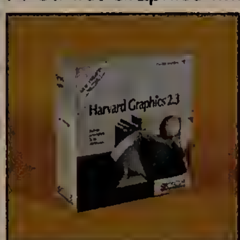

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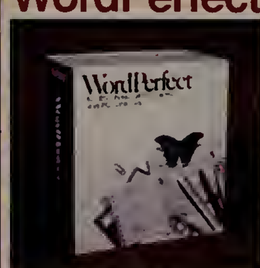

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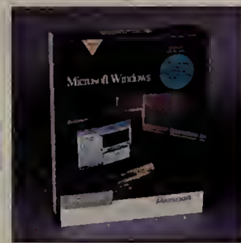

The graphical user interface everyone is talking about! Turns your 286 or above with 640K or more of memory into a powerful multitasking workstation that runs even non-Windows applications. Plus, if you buy Windows now from FastMicro, we'll throw in 10 of the best Windows shareware programs.

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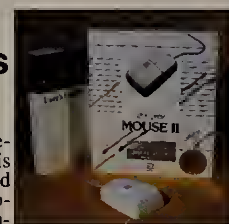

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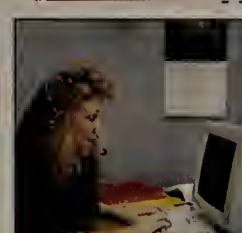

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Circle 55 on reader service card

Personal Laser Printers:

Looking Better All the Time

Prices are down, performance up. Apply a little cost-benefit analysis, and you may just discover that one of the laser printers reviewed here deserves a place on your desktop.

Scott Spanbauer

ROBERT CARDIN

If all desktops were this clean, you wouldn't need a small printer. But they aren't, and that's a big reason why the small-footprint LaserJet IIP is a Best Buy. The IIP combines a compact design with smooth output and elegant, easy-to-master controls. For personal laser printers, it's still the one to beat.

Can we get personal for a moment? It's about your printer. If you're thinking about buying a printer for your home or small business—or if you're sick of schlepping between your desk and the network print station—isn't it about time you considered a personal laser?

Sure, there are less expensive alternatives. A good 24-pin dot matrix printer will cost you $300 to $600 and is your best choice for wide-carriage printing and multipart forms. But most dot matrix machines offer limited font talents, print lousy graphics, and make more noise than a dentist's drill.

What about an ink jet, you ask? For about $600 you'll get whisper-quiet printing and output quality approaching that of lasers. But ink jets are generally slow, the text often smears, and printing densely inked graphics can give your pages a puckered look.

Personal lasers, on the other hand, are like compact cars: They're cheap, fit easily in small spaces, and give you great handling on those tight graphics corners. For a base-model street price of around $1000, you get sharp text and images, quiet operation, font versatility, and near-universal software support—all in a box small enough to park on a crowded desktop.

What you don't get are top speed and LAN-power paper handling. Most personal lasers run at 4 to 6 pages per minute (ppm) and can't catch Hewlett-Packard's 8-ppm LaserJet III. They also lack options found in printers that are built to be shared, such as multiple paper trays and long duty cycles. But such features are less important when the device serves only one user.

ROBERT CARDIN

Look familiar? The HL-4 offers the same engine and compact footprint as HP's IIP.

Is a personal laser the solution to your output needs? This review looks at six low-cost machines that provide LaserJet Series II–quality printing (see the sidebar "Buying Smart: Making the Personal Choice" for our evaluation criteria). All offer street prices between $994 and $2199 in the *PC World* configuration, which includes 1.5MB of RAM and at least a 200-sheet paper tray.

The result is two Best Buys. The HP LaserJet IIP retains the Best Buy it won last year (see "A Laser on Every Desk," March 1990), thanks to its compact design and fine output quality. It's no longer the cheapest, but it's still the best printer in its class. Our second Best Buy, the Panasonic KX-P4420, combines top performance with the sharpest-looking graphics in the roundup. Though it's big to be called a personal printer, most users will find its low street price friendly enough.

Brother HL-4

PROS: Fast graphics printing, excellent selection of resident fonts, small footprint

CONS: Horizontal banding on graphics, slow text printing

The HL-4 is in many ways a twin brother to the LaserJet IIP: Both use the same printer chassis and 4-ppm Canon engine, and both are slow at printing text. But at a street price of $1381, the Brother is about $100 cheaper, and it bests its next of kin in resident fonts and graphics print speed. Unfortunately, its graphics quality can't match the IIP's, making it the lesser of the two.

Because of the way the HL-4 is constructed—the paper trays are on the side instead of in front—the HL-4 needs about a third more desktop area than the IIP. Still, that's far less than the other reviewed printers require.

Setup is a snap. A single toner cartridge slips in through a side door, as does the optional lower paper cassette. Strangely, Brother offers no trays for envelopes or legal- and A4-sized paper, but you can use ones made for the IIP.

Adding memory is nearly as simple: Unscrew a cover plate on the rear of the printer, and slide in the board. However, the HL-4 has only one memory slot, and you can't add memory to an existing board. Upgrading from 1.5MB to 2.5-MB means chucking the 1MB board and starting from scratch. (However, Brother claims its built-in data compression lets you print graphics using less memory than other printers require.) If you need technical help, have patience: Calls to the support lines produced busy signals and long waits on hold.

Thanks to its enhanced printer controller, the Brother put graphics to paper even faster overall than the 8-ppm Panasonic KX-P4420. However, the images showed unacceptable banding and washed-out areas. Text was crisp enough, but printing it took a long time.

Fonts are where the HL-4 shines. It comes with 20 resident typefaces and emulates almost every printer you could want. Also, you can install a $195 scalable font card containing versions of Times Roman and Helvetica. The card comes with drivers for *WordPerfect* and *Windows* that allow the Brother to emulate the LaserJet III.

The HL-4 offers a small chassis and some nice font options, but it can't match its sibling in graphics quality. If you don't need to print graphics, you'll find it a superb value, but most users will like the IIP better.

HP LaserJet IIP

PROS: Excellent design, small footprint, superb technical support

CONS: Slow, skimps on resident fonts

When it comes to personal lasers, the first question is whether to opt for the LaserJet IIP. The HP's design is second

Laser Power for Your Desk

The LaserJet IIP gives you all the printer essentials in a space-saving form. But if you want top speed and graphics output, go with the powerful but bulky Panasonic KX-P4420.

● Yes
○ No
◒ Deficient
n/a = not available

	Brother HL-4	HP LaserJet IIP	IBM LaserPrinter E	Okidata OL400 LED Page Printer	Panasonic KX-P4420 Laser Partner	Tandy LP 950
Standard features						
List price[1]	$2185	$2025	$1944	$1270	$1890	$2199[2]
Street price[1]	$1381	$1493	$1500	$994[3]	$1334	$2199[2]
Rated speed	4 ppm	4 ppm	5 ppm	4 ppm	8 ppm	6 ppm
Standard memory	512K	512K	512K	512K	512K	512K
Maximum memory	4.5MB	4.5MB	4MB	2.5MB	4.5MB	2MB
Cost per page (cents)[4]	3	3	1.7	3.25	2.9	3
Monthly duty cycle (pages)	2500	6000	12,000	3000	3000	n/a
Design						
Desktop area required (square inches)[5]	595	456	656	910	910[6]	676
LCD display	●	●	○	●	●	●
Darkness controls	○	●	●	●	●	○
Typographic features						
Resident typefaces (portrait/landscape)	20/20	7/7	12/12	12/5	11/11	12/12
Cartridge slots	2	1	2	1	2	2
Accepts HP font cartridges	○	●	○	○	●	○
Accepts PCL soft fonts	●	●	●	●	●	●
Supports proprietary font cartridges	●	●	●	●	●	●
Supports third-party superfont cartridges	○	●	○	○	●	○
Supports PostScript cartridges	○	●	○[7]	○	●	○
Emulations						
LaserJet Series II	●[8]	●	●	●	●	●
LaserJet III	○	●	○	○	●	○
Epson FX	●	◒[9]	○	○	●	●
IBM Proprinter	●	◒[9]	○	○	●	●
Diablo 630	●	●	○	○	●	●
HP 7475A plotter	◒[10]	●	●	○	●	○
Paper handling						
Standard capacity (sheets)	50	50	200	200	250	250
Maximum capacity (sheets)	300	300	700	200	250	250
Prints legal-sized paper, envelopes, labels, transparencies	●	●	●	●	●	●
Faceup and facedown output	●	●	●	●	●	●
		BEST BUY			BEST BUY	

[1] With 1.5MB RAM and at least a 200-sheet paper tray.
[2] Includes 2MB RAM.
[3] Street price based on estimated 22 percent discount.
[4] Manufacturers' own estimates based on cost of consumables.
[5] Based on manufacturers' recommended side and rear clearances.
[6] 1681 inches with recommended side clearance for replacing drum and developer.
[7] IBM sells an internal PostScript upgrade board.
[8] Emulates the LaserJet IIP.
[9] Requires optional cartridge.
[10] Requires optional HPGL card.

BUYING SMART: MAKING THE PERSONAL CHOICE

The most personal thing about a personal laser printer is price, but the most important is its output quality. Even a cheap printer is a bum steer if it turns out cheesy output or can't stomach all your soft fonts. The printer should also feature a compact design and controls that even a greenhorn can master. Here's what to look for, in order of importance.

OUTPUT QUALITY

If a laser printer can't give you sharp output, don't buy it. Test-drive your printer to ensure that text is crisp and readable at all sizes and that bit-mapped graphics display a good range of gray tones and a minimum of vertical and horizontal banding (streaks of light and dark pixels). Darkness controls, like those found on the IBM, Panasonic, and Okidata printers, are a big help in enhancing output.

PRICE

With personal lasers, the magic number is "under $1000." But like most magic, it's largely an illusion. We called dealers across the country for street price quotes, then averaged the results. (Where street prices were unavailable, we provided an estimate.) Factoring in the cost of necessities such as an extra megabyte of RAM, plus paper trays for the IIP and the HL-4, brought all but the Okidata well over the $1000 mark.

DESIGN

Unless you're a big shot in a corner office, desktop space is a cherished commodity. A printer with a small chassis is a big plus—especially since you'll need at least 3 to 4 inches for side and rear ventilation, plus enough vertical clearance to pop the hood and replace consumables. (Our calculations of printer space requirements include chassis size plus the manufacturers' recommended rear and side clearances.)

Look for space-saving features like recessed cable connectors, side-mounted font cartridge slots, front-mounted faceup delivery trays, and paper trays that don't jut out into space.

TYPOGRAPHIC FEATURES

Fonts are the key to good-looking documents. Your printer should provide a reasonable selection of resident typefaces, plus a variety of font cartridge options and enough memory to handle downloadable soft fonts. Generally, you'll need at least 1.5MB of RAM for downloading fonts or printing full-page graphics, more if you use lots of large fonts. Demand no less than 4MB of RAM capacity; having less may limit the number of fonts you can use. And multiple emulations are a plus, especially if your applications require dot matrix or plotter output.

EASE OF USE

In a perfect world, you'd unpack your printer, hook it to your PC, and start printing. The real world, however, requires you to add toner and other consumables, install memory upgrades, and change printer settings. Look for printers that offer integrated toner/developer/drum cartridges—they're more expensive but easier to replace, and the messy black powder usually stays inside.

Installing memory should be a one-step process: Just plug a memory cartridge into an exterior slot, à la the Tandy LP 950. Unfortunately, most printers still require you to pry open the chassis and install circuit boards and chips—a job you may want to leave to your dealer.

Since you'll occasionally have to change settings such as emulation modes, look for a front control panel with a readable LCD display and logical, tree-structured menus. And for those moments when your printer bogs down, look for a vendor that'll help pull you from the swamp with strong service-and-support policies. We called vendor support lines at various hours of the day to rate their responsiveness; results are reported in the individual reviews.

PAPER HANDLING

For shared printers, high paper capacity is essential; with personal laser printers, variety is more important than volume. Your printer should handle all the usual suspects, including envelopes, transparencies, and labels, and hold at least 200 sheets. All the printers match up closely here, but HP and Brother make you pay extra for the paper trays.

PERFORMANCE

Nobody loves a slow printer. But unless you share a device—or spend all day churning out 50-page reports—speed is more a luxury than a necessity. Most printers approach their rated engine speeds in text printing, but graphics print speeds vary. For example, while the 8-ppm Panasonic KX-P4420 proved fastest at text printing, the 4-ppm Brother HL-4 was tops in graphics. —S. S.

to none, its output quality is above average, and its $1493 street price is competitive, though no longer the cheapest. The IIP isn't perfect—it's slow and offers a meager selection of resident fonts—but if you need a reliable, high-quality printer that will fit almost anywhere, it's your Best Buy.

HP's strategy for building a printer around the Canon LBP-LX engine is better than Brother's. The IIP's paper trays open from the front of the machine, offering much easier access, and faceup printouts come out of the front of the IIP, not the back. At 456 square inches, the IIP eats up about half the space of its big brother, the LaserJet III—and far less than any of the other printers in this roundup.

Installing memory is trickier than with the Brother—you must remove the interface board to get at the two memory slots. HP lets you add up to 4MB of RAM in 1MB installments, or you can add third-party RAM for about half the cost of HP's. Well-illustrated instructions make adding toner or the optional paper tray a 2-minute operation. If you find yourself floundering, HP's tech support staff will provide instant, accurate assistance.

Speed is not the IIP's forte, however—it vied with Okidata's OL400 for last place. The IIP prints fine text and good-looking graphics; the test images showed light horizontal banding but otherwise contained a good range of tones.

Like the Brother, the personal LaserJet comes with only a 50-sheet paper feeder—you'll have to purchase a 250-sheet tray separately. You also get a paltry seven resident fonts and only one font cartridge slot. Still, that one slot accepts cartridges from virtually every manufacturer on the planet, plus Adobe and Pacific Data PostScript emulation cartridges. No other reviewed printer offers a PostScript cartridge option.

With its compact design and attractive output, the IIP should manage to survive the slings and arrows of an increasingly price-sensitive market. It's still the printer to beat.

ROBERT CARDIN

IBM's LaserPrinter E produces handsome output at high speeds, but you'll have to master its complex control panel and dig through the manual to decipher cryptic error messages.

IBM LaserPrinter E

PROS: Fast, sharp output, long duty cycle

CONS: Confusing control panel, dealer support only

The $1500 LaserPrinter E is talented, but it could stand to learn a few social graces. The printer can shoulder a hefty duty cycle, costs little to operate, and is second only to the Panasonic in speed and quality. But good luck figuring out how to make it work—IBM has built in a control panel only an engineer could love. That, and the lack of a technical support hot line, keep the LaserPrinter E out of the Best Buy circle.

How much do you know about printers? The IBM will test your knowledge—and your patience. Unlike the other machines, the LaserPrinter E lacks an LCD readout, and it's not clear how to do tasks such as switching from IBM to HP emulation mode. Many operations involve turning the unit off, then back on, while holding down an arbitrary combination of buttons. Be sure to keep the well-indexed manual close at hand. If you get lost, you'll have to rely on your local dealer.

Despite the personal price, the IBM longs to be shared: It features a beefy duty cycle of 12,000 pages a month. You can upgrade its 5-ppm engine to 10 ppm via an $1100 add-in board, easily install a 500-sheet lower tray, and clip on a power envelope feeder. With or without the attachments, the LaserPrinter E consumes a fairly compact 656 square inches. Just don't place it under a shelf: Opening the printer requires about 2 feet of clearance.

Plugging in the toner cartridge is a breeze, and since the IBM's cartridge lasts significantly longer than the other printers' (15,000 pages versus 3000), printing costs are an impressively low 1.7 cents per page. Installing RAM, however, involves handling integrated circuit boards. Let your dealer do it.

The LaserPrinter E finished among the top three performers in speed tests. It produced clean black type and clear bit-mapped images nearly free of hori-

Panasonic's KX-P4420 Laser Partner consumes a sizable parcel of desktop property, but its text and graphics quality is second to none, and you won't find a faster laser for less.

ROBERT CARDIN

zontal banding. However, midlevel grays tended to disappear, and adjusting the printer's contrast controls caused no improvement.

Though its standard font features are nothing special, the IBM provides plenty of font options, including card-based fonts and a PostScript add-in board. The LaserPrinter E also comes standard with plotter emulation—good news for all you *AutoCAD* fans.

The LaserPrinter E is a powerful, well-built machine that's great for technically savvy users but a little daunting for most others. If you've got the know-how—or a solid in-house tech support department—it's a good buy.

Okidata OL400 LED Page Printer

PROS: Inexpensive, sharp text output

CONS: Big footprint, below-average speed, graphics marred by banding

Midway through our review of the OkiLaser 400, Okidata changed the product's name and slashed its retail price from $1395 to $999, causing printer vendors all over the country to reach for the Maalox. Dealer prices weren't available at press time, but factoring in the cost of extra memory and a conservative 22 percent discount, the OL400 should cost around $1000 on the street—making it the cheapest laser around. Unfortunately, it's also one of the slowest, and its font options and image quality are less than impressive. Even at its bargain-basement price, the Okidata printer is only a fair value.

Thanks to useful darkness controls, the OL400 lays down sharp text and bit maps showing good tonal range. But the test images were marred by a checkerboard of horizontal and vertical banding—the worst of the printers reviewed. The printer's 4-ppm print speed tied it with the LaserJet IIP for last place.

The OL400 consumes far too much desktop real estate. It's only 5½ inches high, but a wide chassis and extending paper trays bump its territorial requirements to a whopping 910 square inches—about what you'd need for a LaserJet III.

The OL400's typographic options are also less than visionary: It comes with 12 portrait fonts but only 5 landscape ones. Optional font cards are limited to a Times Roman clone and a few typewriter faces, so OL400 owners will have to rely on downloaded fonts. The OL400's 2.5MB memory capacity should be sufficient for most users, but if you print high-resolution graphics in combination with a variety of typefaces, you may run out of RAM.

Installing extra memory involves prying off the control panel, removing the external case, installing a circuit board, and populating the board with RAM chips—a job best left to your dealer. But plugging in the OL400's drum and toner cartridge is easy, thanks to the manual's well-illustrated instructions, and Okidata's technical support lines proved second only to HP's in responsiveness.

If you never need to print bit-mapped graphics, the OL400 provides solid text printing at a price that's hard to resist. But its big footprint, limited typographic talents, and inferior graphics quality should convince you to try.

Panasonic KX-P4420 Laser Partner

PROS: Fast, excellent print quality, fairly inexpensive

CONS: Big, messy toner replacement, tech support hard to reach

If every desk were Cadillac-sized, Panasonic's KX-P4420 would be the undisputed king of the desktop. At $1334 on the street, it beats all comers except the Okidata, and its 8-ppm engine combines superior speed with sterling output, making it a clear Best Buy. But the only thing personal about the Panasonic is its price: It's big and fast enough to serve a work group, and it requires some technical know-how to set up. If you've got the room and you're willing to get your hands dirty, the KX-P4420 is a steal.

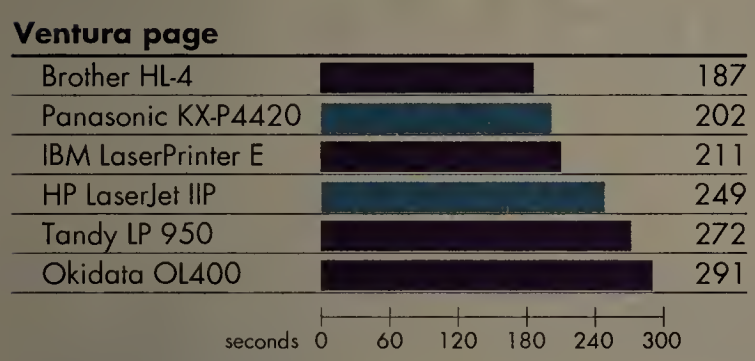
The good news here concerns speed and output. The Panasonic finished first in text printing and a close second overall to the Brother in graphics. Thanks to its handy print density controls, the KX-P4420 produced excellent text and the best-looking images of any printer reviewed, with pleasing density and tonal range and only mild banding.

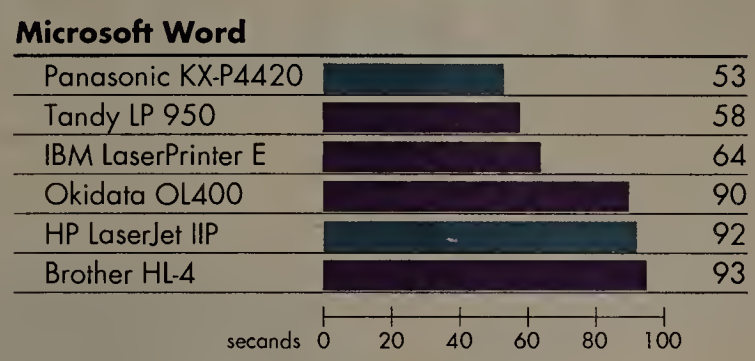
The KX-P4420 is a big box that requires a lot of elbowroom. In addition to

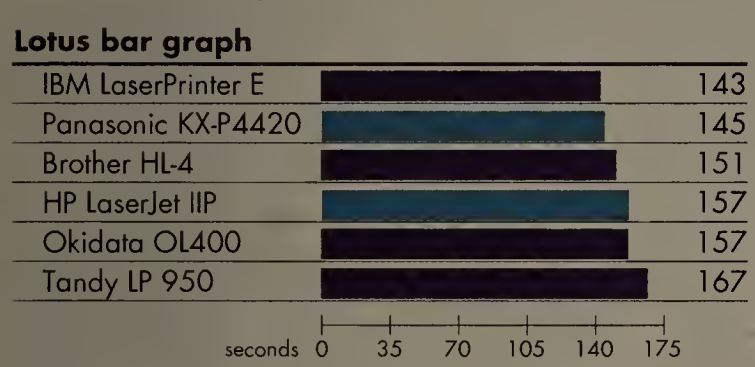
Panasonic's Personal Best

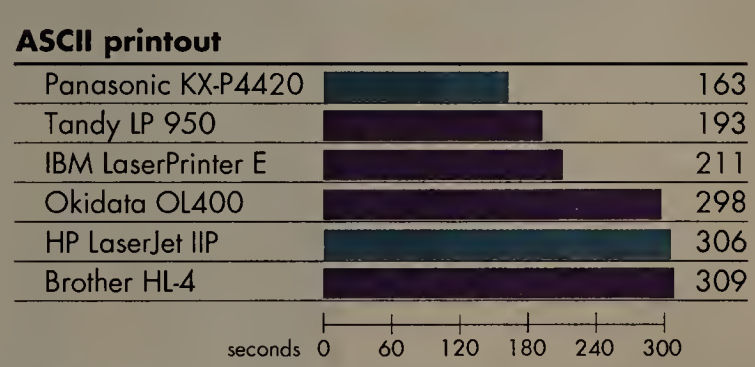
Personal lasers usually print at a leisurely pace compared with full-sized lasers, but with the speedy Best Buy Panasonic KX-P4420, there's little compromise. The LaserJet IIP is slower, but excellent ease of use and a tiny footprint earn it a Best Buy.

Best Buy









Methodology
All printers were connected to the porollel port of on 8-MHz IBM PC AT Model 339 running under DOS 3.3 with 640K of RAM ond o 30MB hord disk. The opplicotions used in the benchmorks were instolled on the hord disk olong with their test files in discrete subdirectories. All tests were timed from the moment the print commond wos initioted until the lost poge wos ejected from the printer.

Ventura page
A single newsletter-style *Venturo Publisher 2.0* poge is printed. It consists of o small sconned TIFF imoge, o lorge EPS imoge, o 36-point Helvetico heodline, ond 12-point Times Roman body text.

Lotus bar graph
A simple *Latus 1-2-3 2.2* stocked bor chort is printed.

Microsoft Word
A 4½-poge *Microsoft Word 5.0* document is printed. It is composed primorily of 10-chorocter-per-inch (cpi) Courier text with o sompling of 16.66-cpi, bold, ond underlined text.

ASCII printout
Twenty poges of dense ASCII text ore printed. Eoch poge is o solid 64-by-58 grid of rondomly generoted ASCII chorocters; every poge is seporoted by o formfeed.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

the usual side and rear clearances, Panasonic recommends another 20 inches to the right for installing the drum and developer. That translates into a condominium-sized footprint of 1681 square inches. If you're willing to rotate the machine 90 degrees when it's time to replace consumables, you can get by with approximately 900 square inches —about the same amount of room the Okidata requires.

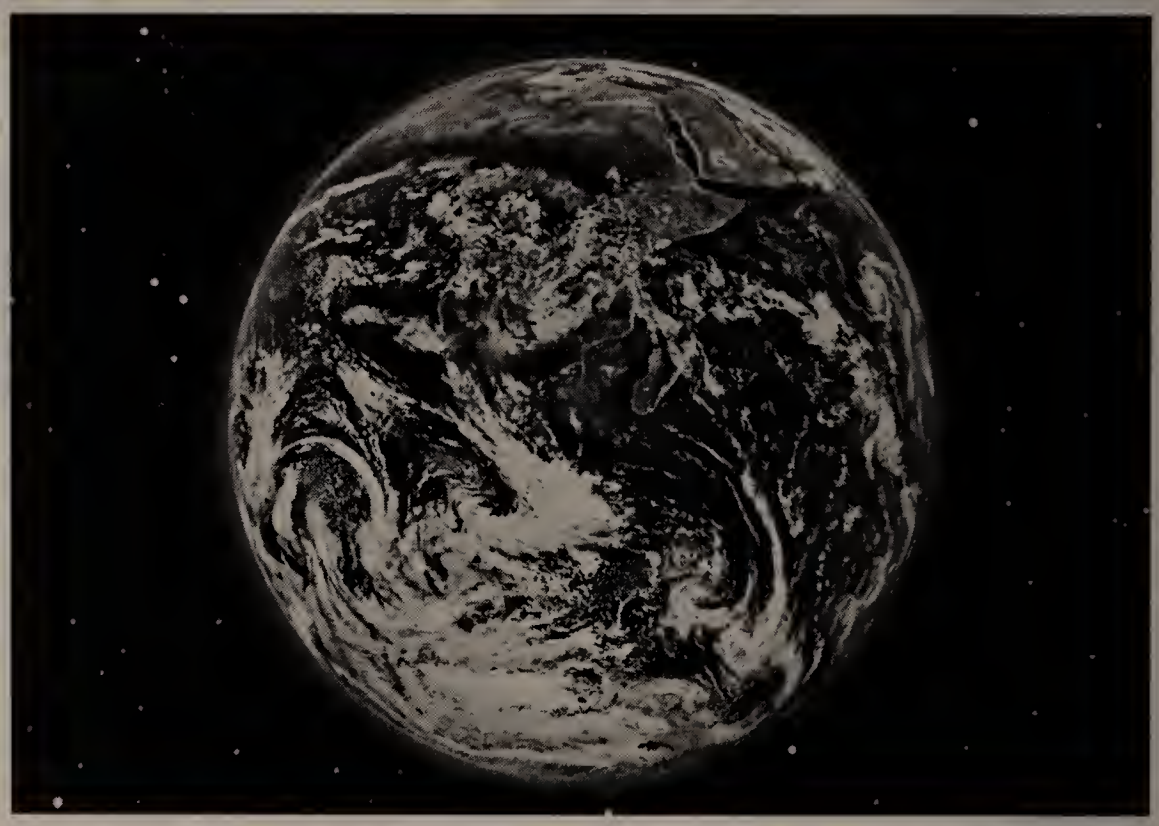
Installing the printer's drum, developer, and toner cartridges is a simple but potentially messy process. This is the only machine that requires you to open the toner cartridge *before* you place it in the printer. Even if you're extremely careful, you'll probably still get black powder on your desk.

Installing memory upgrades is fine for users who feel comfortable mucking around inside a computer; otherwise, have your dealer do it. The KX-P4420's slide-out logic board accepts two 1MB or 2MB boards, giving you plenty of RAM upgrade options. But if you run into technical problems, you may have trouble getting help. Numerous calls to Panasonic's East Coast tech support line produced nothing but an earful of busy signal.

With its high speed, output talents, and low price, the KX-P4420 Laser Partner makes a great buy—but you may want to put the printer next to your desk instead of on top of it.

"Dow Jones helps me protect the assets of this vital multinational outfit."

—***David Hess,*** *Executive Director, Environmental Resources and Energy Committee, Pennsylvania Senate*



David Hess works for the state.

But he also works for his neighbors, strangers and countless inhabitants of the animal kingdom.

Because David Hess helps develop environmental legislation for the state of Pennsylvania.

And he's discovered a significant way to help protect the world's limited resources. He simply taps into the practically unlimited resources of Dow Jones News/Retrieval.

Within seconds of his request, a world of comprehensive, timely and accurate information makes its way to his computer. And suddenly David Hess knows how communities next door and thousands of miles away approach the same problems.

If wetlands legislation is enacted anywhere in the country, one of the many local and regional newspapers will have the story. If a fast food company announces a new recycling plan, the news is on the screen within seconds of its release.

Also making his job easier are hundreds of other rich information sources, including the complete text of *The Wall Street Journal* and full coverage of all the Dow Jones Newswires.

As Hess says, "Before, I had to pore through the library, call each state over and over again. Or worse, not have the information at all. I can't emphasize enough how much time I save by using News/Retrieval for everything I do."

A savings that's reflected on the profit/loss statement of the one enterprise we all belong to.

DOW JONES NEWS/RETRIEVAL®

The lifeblood of business.℠

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For more details, call 1-800-522-3567, Ext 245. In N.J., call 1-609-520-8349, Ext 245.

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386SX under the hood. Light weight under your arm.

In the computer world, power and speed translate into weight and bulk. That means if you're a person on the go, you'd have to play part-time weight lifter, or be willing to sacrifice megahertz and megabytes.

But now those days are over. Because now there's the Altima NSX notebook computer. It's light. It's sleek. And, oh my, is it powerful.

The 80386SX, 32-bit microprocessor runs at 16 MHz. Plus there are two megabytes of RAM that can expand all the way up to eight. The Altima NSX also has a built-in 1.44 megabyte floppy and a 20 megabyte hard drive.

What's more, all of this is packed into a handsome 9 lb. package that can easily fit inside most briefcases.

So now you don't have to carry your attaché in one hand, a portable computer in the other, and your airline tickets between your teeth.

But the exciting part is when you begin working. You'll appreciate the exceptional resolution of the paper white LCD display. You'll admire the VGA screen with its 32-level gray scaling. And you'll be pleased knowing that the 2400 baud modem didn't cost you a penny extra.

If all this isn't enough, how about being able to send a FAX? That's right—a FAX. Altima NSX features a send FAX mode capability that'll let any party with a FAX machine receive an actual paper document.

It's obvious that Altima has thought of everything. But what's nicest of all is they thought of you when putting on the price tag.

altima

Altima Systems, Inc., 1390 Willow Pass Rd., Suite 1050, Concord, CA 94520 800/356-9990

Circle 30 on reader service card

EXECUTIVE SUMMARY

A Laser to Call Your Own

Panasonic and HP deliver personal laser Best Buys.

Personal laser printers offer 300-dpi text and graphics printing for a significantly smaller chunk of change than their full-sized siblings. The key things to look for are price, output quality, and space-saving design for crowded desktops.

Two of these printers have what it takes to merit a Best Buy. Hewlett-Packard's **LaserJet IIP** is still the prototypical personal laser, with fine output and a compact, ergonomic design. Panasonic's **KX-P4420** delivers faster, better-looking output at a great price, but it lacks the HP's slim silhouette and ease of use. Also worthy of note is the solid **IBM LaserPrinter E,** which falls just short of the Panasonic in speed and output quality.

	Brother HL-4	HP LaserJet IIP	IBM LaserPrinter E	Okidata OL400 LED Page Printer	Panasonic KX-P4420 Laser Partner	Tandy LP 950
Output quality	Fair	Good	Good	Fair	Excellent	Poor
Design	Good	Excellent	Good	Fair	Fair	Good
Typographic features	Excellent	Good	Good	Poor	Good	Poor
Paper handling	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Performance	Good	Fair	Good	Fair	Excellent	Good
Ease of use	Good	Excellent	Fair	Fair	Fair	Good
Overall value	Good	Excellent	Good	Fair	Excellent	Fair
		BEST BUY			BEST BUY	
Reader service no.	665	666	667	668	669	670

How we rate personal laser printers
We rate these printers based on information in the Features Evaluation and the PC World Test Report, combined with our opinions of quality, reliability, and user benefit.

Output quality is the key criterion, based on our evaluation of sample text and graphics produced by each printer. To receive an Excellent rating, a printer must produce smooth, legible text and gray-scale images displaying a broad range of tones. Images should not be excessively light or dark and should be relatively free from light and dark bands of pixels.

Design measures the size of a printer's chassis and the placement of its controls, connections, and trays. An Excellent rating indicates that you can use the printer in a space no larger than 500 square inches.

Typographic features takes into account the number of resident typefaces, as well as font cartridge options, printer emulations, and the amount of memory available for downloadable fonts. To earn an Excellent rating, a printer must provide at least 30 internal portrait and landscape fonts, a 4MB capacity, and at least two printer (or plotter) emulations.

Paper handling refers primarily to paper capacity, plus the ability to print on a variety of sizes and types of media. Excellence here indicates the ability to handle envelopes, transparencies, and labels and to hold a minimum of 200 sheets.

Performance ratings reflect how quickly the units print a variety of text and graphics documents. Ratings are based on relative performance scores.

Ease of use rates how easy it is for an average user to configure and use a printer. An Excellent rating means that consumables install in a simple one-step process, printer memory is user upgradable, and you can easily control printer settings via an LCD-equipped front panel. Technical support and extended warranty options must be readily available.

Overall value combines the above criteria, with extra weight given to price, output quality, and design.

Tandy LP 950

PROS: Small, fast text printing, easily upgradable

CONS: Expensive, excessively dark output, limited RAM

The Tandy LP 950 waltzes past most printers in the areas of text printing speed and memory upgrades, but it trips up in price and output quality. Radio Shack, Tandy's exclusive distributor, doesn't cut any deals—list price is street price. At $2199 (with 2MB of RAM), few users are going to ask the LP 950 for a dance.

The LP 950 requires a fairly compact 676 square inches, but setting it up could be easier. You have to install a roller cleaner, toner-collecting container, light-sensitive drum, and developer and toner cartridges; the cartridges aren't labeled, and the manual is poorly illustrated. If you need help, you have to rely on your local Radio Shack dealer.

On the other hand, installing RAM is a cinch. The LP 950's cartridge-based upgrade snaps in just like a font card. Why doesn't everyone do it that way? Too bad it holds only 2MB—documents using several downloaded typefaces and

"I Get Paid to Write Programs. And Now, I'm Writing Them Twice As Fast."

If you write programs for a living, get to know The Clarion Professional Developer® 2.1.

It can cut applications development time by 50% or more without compromising your design. It's so fast and easy, you can complete prototypes while your clients watch.

Professional Developer 2.1 can interface to routines from C and Assembler. It allows import and export of dBASE, BASIC and DIF files. Its application generator produces commented source code which can be easily adapted with its utilities to allow you to generate .EXEs. Network support is included at no extra cost. There are no run-time licenses or fees. And now Version 2.1 includes Report Writer, which allows you to easily and intuitively create ad hoc reports and queries (from Clarion files, non-Clarion files or any combination).

Professional Developer is an immensely powerful, easy-to-use DBMS application developer. We didn't say it: The PC WEEK poll of corporate satisfaction said it. We came out head and shoulders above the 15 other programmable databases. No one else came even close.

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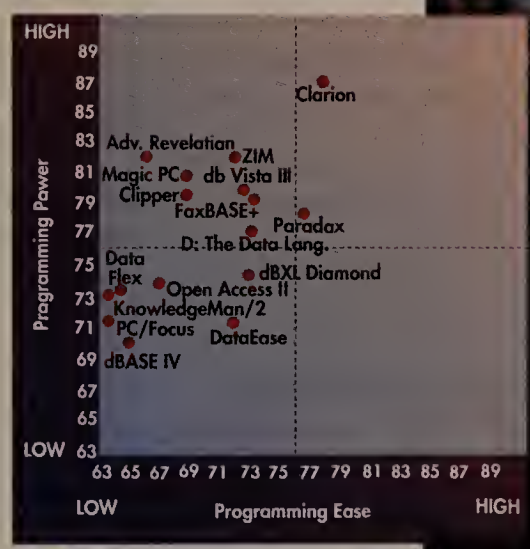

Here's what American corporations in a PC Week survey thought of the power and ease of use of Professional Developer vs. competitors. Any questions?

CLARIONSOFTWARE™

150 East Sample Road, Pompano Beach, FL 33064

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AL, Grove Hill
AFC Systems
(205) 275-8846

CA, Hesperia
Precedent Data Design
(619) 948-0385

CO, Boulder
IQ Computer
(303) 449-1974

FL, Coral Gables
Software Doctor
(305) 446-5124

IL, Arlington Heights
Peak Tech Inc.
(708) 255-0707

MI, Benton Harbor
Video World
(616) 925-9105

OH, Blue Ash
Hard Warehouse
(513) 489-4238

TX, Houston
Amicus Computer Systems
(713) 772-3747

BC, Nanaimo
Concise Systems Corporation
(604) 756-1604

CA, Torrance
Soft Warehouse
(213) 540-0593

CT, New Haven
Cimtech/AOS
(203) 874-8340

ID, Burley
Computer Center
(208) 678-8652

LA, Crowley
Digital Concepts
(318) 788-3597

NY, Smithtown
Createch
(516) 361-7400

OR, Hillsboro
Compatible Computers
(503) 640-0173

WA, Yakima
DYK's Dataworks
(509) 453-0366

Circle 36 on reader service card

high-resolution graphics may be too much for the LP 950.

The Tandy is the only printer reviewed that printed our test images without noticeable banding effects. Unfortunately, images and text were unacceptably dark, and the printer doesn't offer any kind of darkness control. The 6-ppm Tandy finished second in text printing performance but brought up the rear in graphics with the Okidata.

The Tandy LP 950 makes a lot of smooth moves, but its poor graphics and high price aren't going to sweep many users off their feet. If you're willing to pay this much for a printer, you might as well buy a LaserJet III.

Get on the Beam

When it comes to laser printing at bargain prices, you have more choices than ever. If compact design and easy operation are your meat and potatoes, the HP LaserJet IIP is still the dish of choice. If print speed and high-quality graphics outweigh small footprints and easy setup, the Panasonic KX-P4420 is heavyweight champ, with the IBM LaserPrinter E a close contender.

But keep your eye on this market: By the time this magazine hits the newsstand, other vendors may have followed Okidata's price-slashing lead, making these printers not merely personal but downright familiar.

Scott Spanbauer is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 902.

WHERE TO BUY

Brother HL-4
Brother Int'l Corp.
200 Cottontail Ln.
Somerset, NJ 08873
201/981-0300,
201/469-4415 (fax)
LIST PRICE: $1495
ACCESSORIES: 250-sheet paper cassette with letter tray $195; 1MB memory upgrade $495, 2MB memory upgrade $990, 4MB memory upgrade $1980; font cards $195; scalable font card $195; HPGL plotter emulation card $295
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available through dealer
TECHNICAL SUPPORT: toll-free number, M–F 9–4
OTHER SUPPORT: available through dealer
Reader service no. 665

HP LaserJet IIP
Hewlett-Packard
Customer Information Center
19310 Pruneridge Ave.
Cupertino, CA 95014
800/752-0900
LIST PRICE: $1495
ACCESSORIES: 250-sheet paper cassette with letter or A4 tray $195, additional letter or A4 tray $69, legal tray $79, executive-sized tray $75, envelope tray $89; 1MB memory board $335, 2MB memory board $560; Epson/IBM emulation cartridge $175; PostScript cartridge $695; EP-L toner cartridge $95
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available through dealer
TECHNICAL SUPPORT: toll number, M–F 8–5
OTHER SUPPORT: fax number for updates on software support
Reader service no. 666

IBM LaserPrinter E
IBM
101 Paragon Dr.
Montvale, NJ 07645
800/426-2468
LIST PRICE: $1495
ACCESSORIES: 500-sheet paper feeder $399; 500-sheet letter-sized paper tray $89, 500-sheet legal tray $99, 200-sheet letter tray $59, 200-sheet legal tray $69, 75-envelope feeder $329; 1MB memory upgrade $449, 2MB memory upgrade $899, 3.5MB memory upgrade $1599; font cards $142–$245; PostScript option $499, Premium PostScript option $899; PostScript outline font card $699; Model E upgrade option $1099; High Yield print cartridge $199
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available through dealer
TECHNICAL SUPPORT: available through dealer
OTHER SUPPORT: none
Reader service no. 667

Okidata OL400 LED Page Printer
Okidata Customer Information Center
532 Fellowship Rd.
Mount Laurel, NJ 08054
800/654-3282,
609/778-4184 (fax)
LIST PRICE: $999
ACCESSORIES: 200-sheet paper trays (all sizes) $89, 15-envelope tray $89; 1MB memory board $275, additional 1MB RAM $275; serial or parallel interface $95; font cards $195–$295; toner cartridge $33; image drum $289
WARRANTY: one year parts and labor on printer, five years on LED printhead only, carry-in
EXTENDED WARRANTY: none
TECHNICAL SUPPORT: toll-free number, M–F 9–5
OTHER SUPPORT: none
Reader service no. 668

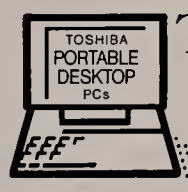
Panasonic KX-P4420 Laser Partner
Panasonic Communications & Systems Co.
2 Panasonic Way
Secaucus, NJ 07094
800/346-4768
LIST PRICE: $1395
ACCESSORIES: 250-sheet letter-sized paper tray $49, 250-sheet legal-sized paper tray $59, 50-envelope tray $85; 1MB memory expansion $495, 2MB memory expansion $945; serial interface $139; font cards $145; toner kit $49; developer unit $109; drum unit $119; ozone filter $29; corona $29; fuser unit $139
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available through dealer
TECHNICAL SUPPORT: toll-free number, M–F 9–5
OTHER SUPPORT: available through dealer
Reader service no. 669

Tandy LP 950
Tandy Corp.
1800 One Tandy Center
Fort Worth, TX 76102
817/390-3011
LIST PRICE: $1599
ACCESSORIES: 250-sheet letter tray $69.95, 250-sheet legal tray $69.95, sheet feeder $349.95, envelope feeder $349.95; 1.5MB memory upgrade $599.95; font cards $249.95; toner cartridge $64.95; developer cartridge $149.95; drum cartridge $149.95
WARRANTY: one year parts and labor, carry-in
EXTENDED WARRANTY: available through Radio Shack
TECHNICAL SUPPORT: toll number, M–F 8:30–5:30
OTHER SUPPORT: forums on CompuServe and PC-Link
Reader service no. 670

Circle 256 on reader service card

IT HAS BEEN
BROUGHT TO
OUR ATTENTION
THAT NOT EVERYONE
BELIEVES
PORTABLE PCS
CAN BE AS
FUNCTIONAL AS
DESKTOP PCS.

THIS SHOUL



This may be hard to believe, but there really is such a thing as a portable PC that can do everything a conventional desktop can.

Some people can't imagine squeezing a 40, 100 or even a 200MB hard disk into a portable PC. But when they take advantage of all that storage capacity, they find it hard to imagine life without it.

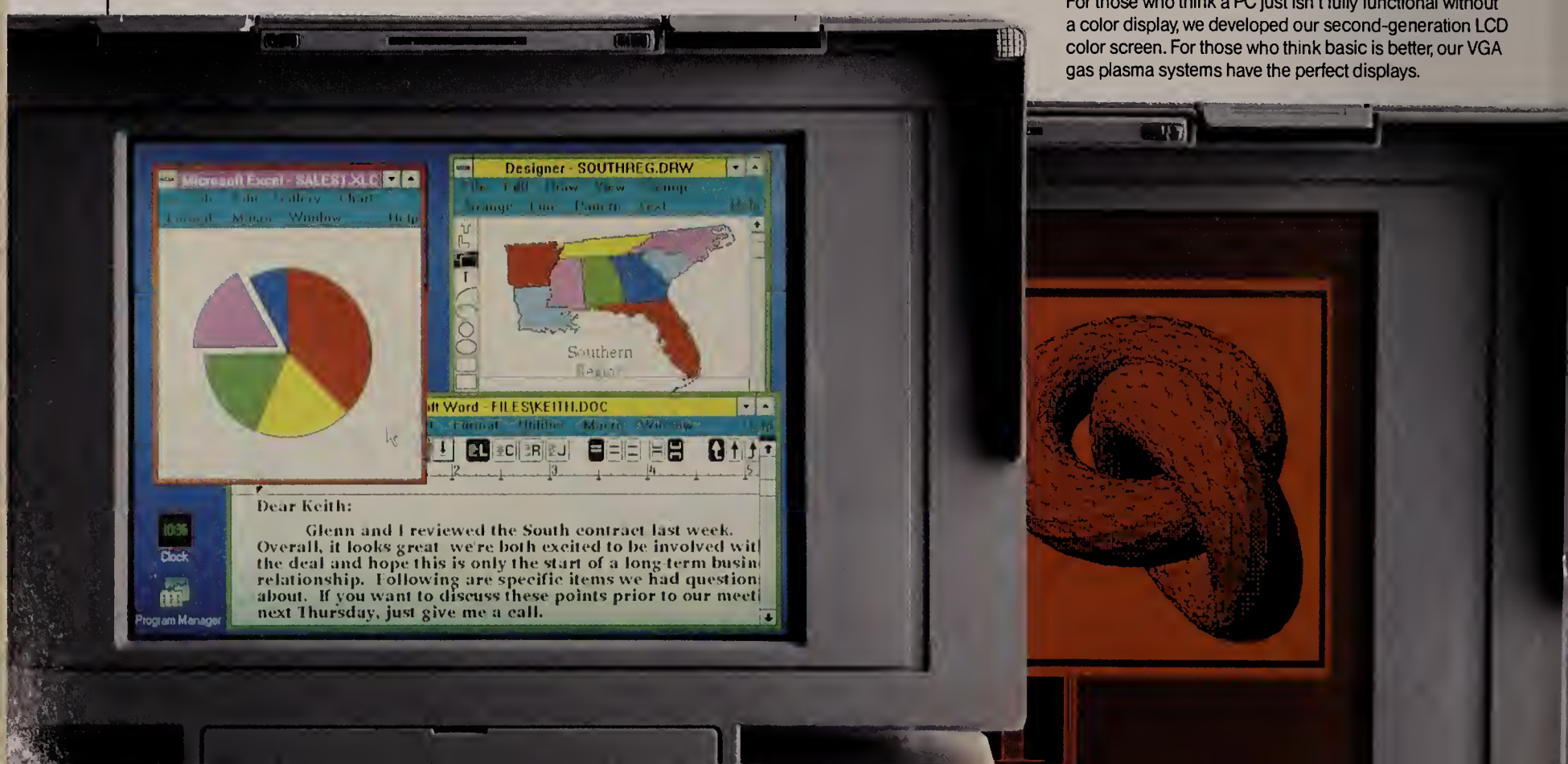
In fact, there's not just one, but an entire line of them. They're called Toshiba Portable Desktops,™ and they'll forever change the way your company looks at power and productivity.

To get more information or a free Portable Desktop productivity survey, call 1-800-477-1616.

True, some business people may have trouble grasping the notion of desktop power in a portable, but when you give it some thought, it's the next logical step in computers.

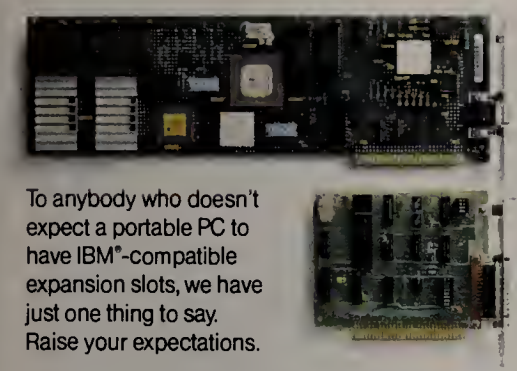
There once was a day when microprocessors this powerful were unheard of in a portable. Luckily for people who crave raw power and computing speed, that day is over.

With 386™ and 386™SX microprocessors, our Portable Desk-



For those who think a PC just isn't fully functional without a color display, we developed our second-generation LCD color screen. For those who think basic is better, our VGA gas plasma systems have the perfect displays.

REMOVE ALL DOUBT.



To anybody who doesn't expect a portable PC to have IBM®-compatible expansion slots, we have just one thing to say. Raise your expectations.

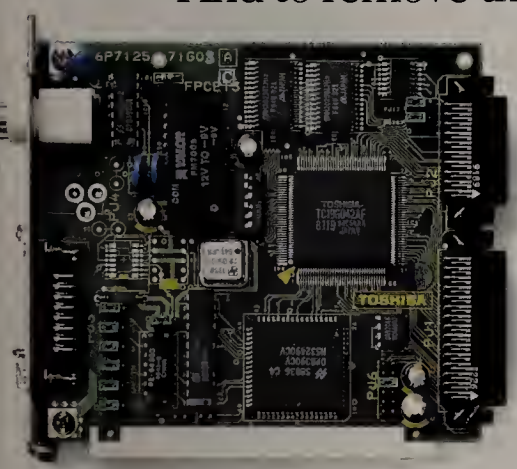
tops run all of the same applications as your company's conventional PCs. With hard disk drives from 40 to 200MB, you have all the flexibility to configure a system the way you want it.

Anyone who insists portable PC users are doomed to cramped, undersized keyboards hasn't gotten their hands on a Toshiba. We use standard-size keys and standardized key spacing so your hands will feel right at home.

With the connectivity of our multiple expansion slots and ports, our Portable Desktops fit right in with your existing system and grow as your company grows.

They say you can't squeeze much memory into a portable PC. But considering that our dedicated memory expansion slots let you add up to 12MB of RAM as your need for power grows, it looks like "they" were wrong again.

And to remove the last possible barrier between your needs and our portables, we've even designed one with a high-resolution VGA color screen.



With an expansion slot for a LAN card, you get complete networking freedom without giving up all your other expansion slots.

In other words, it really is possible to have all the capabilities of a conventional desktop in a portable.

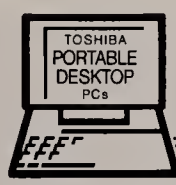
All you have to do is try one. And believe.

T5200. 386 microprocessor, 40, 100 or 200MB HDD, 2 to 14MB RAM, 2 IBM-compatible expansion slots (in addition to dedicated memory slots), VGA plasma display.

T5200C. 386 microprocessor, 200MB HDD, 2 to 14MB RAM, 2 IBM-compatible expansion slots (in addition to dedicated memory slots), VGA passive matrix color LCD display.

T3200SX. 386SX microprocessor, 40 or 120MB HDD, 1 to 13MB RAM, 2 IBM-compatible expansion slots (in addition to dedicated modem and memory slots), VGA plasma display.

NOW THAT YOU'RE CONVINCED



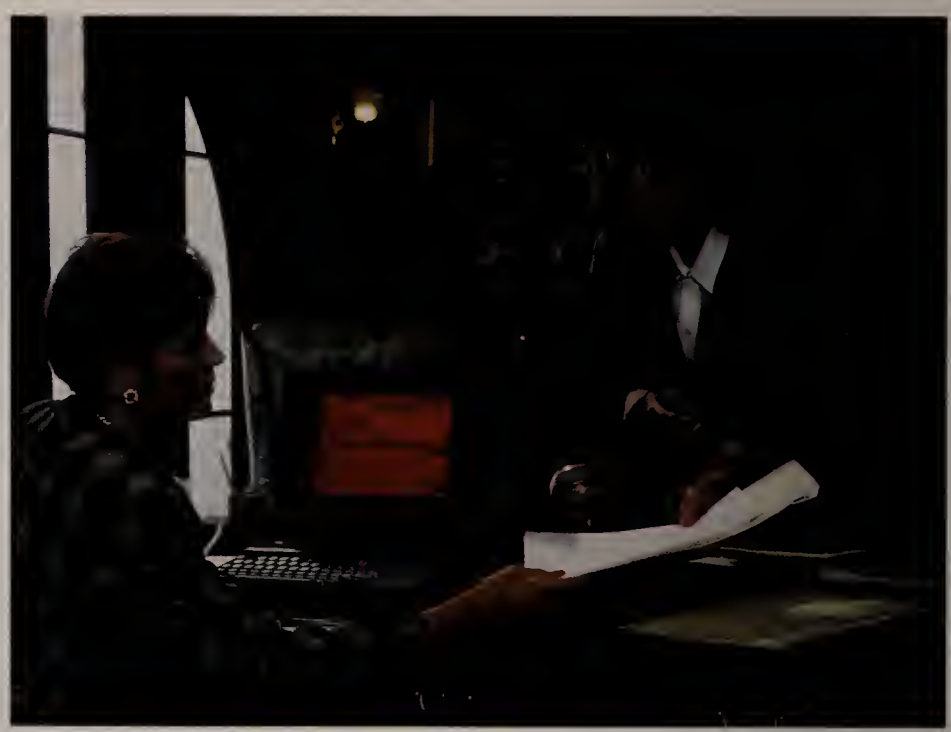
Okay, let's suppose you suddenly discover your company filled with powerful Toshiba Portable Desktops.

Now what?

First of all, your people can do everything around the office they've been doing with their desktop computers.

Giving your people instant access to vital information can keep them doing what they do best. Working smart.

Then your key employees can turn after-hours time into productive time, since their dining room tables and breakfast nooks can serve as off-site workstations.



Employees can even improve their productivity in the familiar surroundings of their own office. Only now they'll have more desk space to work with.

Your top people can add impact to their presentations with a wealth of information and computing power at their fingertips. And the story can repeat itself—with equally impressive results—everywhere from an office 3,000 miles away to a conference room that's a mere 30 feet down the hall.

To get more information or a free Portable Desktop productivity survey, call 1-800-477-1616.

WHERE DO YOU GO FROM HERE?

Giving your key employees a Portable Desktop means they'll have the flexibility to work when they need to, where they want to.

And yes, all that productivity can even take place within the confines of your own office desk (while using up considerably less of your desk space, we might add).

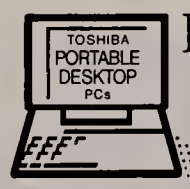
When people have access to computing power outside their office, presentations are more powerful and groups are more productive.

All of which leads us to one very powerful observation.

Now all of your best people can be doing a better job than they ever could when they were chained to conventional desktop PCs.

Better yet, they can do it without sacrificing power, functionability or expandability. Or anything else, for that matter.

THREE POWERFUL ARGUMENTS WHY YOUR NEX



People said it was just a matter of time before someone built a line of portable PCs this powerful. They just didn't know it would happen so soon. With our Portable Desktops, we've successfully combined the power and functionality of desktop PCs into slim, portable packages that give you everything you need to get ahead in business.

T5200

18.7 pounds, 20MHz 80386 with 80387-20 coprocessor socket, 2 internal IBM-compatible expansion slots, 40MB hard disk with 25msec access or 100MB hard disk with 25msec access or 200MB hard disk with 16msec access, 2MB RAM expandable to 14MB, gas plasma VGA display with 16 gray scales, 1.44MB 3½" diskette drive.

T5200C

18.9 pounds, 20MHz, 80386 with 80387-20 coprocessor socket, 2 internal IBM-compatible expansion slots, 200MB hard disk with 16msec access, 2MB RAM expandable to 14MB, passive matrix VGA full-color screen, 1.44MB 3½" diskette drive.

DESKTOP PC SHOULDN'T BE A DESKTOP PC.

So you get the same power. The same functionality. And the same expandability it takes to keep pace with your company's needs. The big difference is that with a Toshiba Portable Desktop, you can easily turn all that power into increased productivity. All thanks to something no desktop PC could ever hope to offer.

The freedom to take it with you.

To get more information or a free Portable Desktop productivity survey, call 1-800-477-1616.

T3200SX

17.0 pounds, 16MHz 80386SX with 80387SX-16 coprocessor socket, 2 internal IBM-compatible expansion slots, 1 dedicated modem slot, 5 built-in ports, 40MB hard disk with 25msec access or 120MB hard disk with 19msec access, 1MB RAM expandable to 13MB, gas plasma VGA display with 16 gray scales, 1.44MB 3½" diskette drive.

DON'T TAKE OUR WORD FOR IT. GET A SECOND OPINION.

What do other companies know about our Portable Desktop PCs that you don't? If you had a copy of our free productivity survey, you'd know. For example, you'd know that 93 percent of portable users said that they'd never go back to using a conventional desktop. You'd know they've reported substantial increases in productivity. And you'd know why they place so much value on the flexibility and freedom their portables have to offer. Toshiba Portable Desktops. They're no longer a matter of convenience, they're a matter of survival.

To get more information or a free Portable Desktop productivity survey, call 1-800-477-1616.

In Touch with Tomorrow

TOSHIBA

Toshiba America Information Systems Inc., Computer Systems Division.

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SPECIAL REPORT

Windows

A PC World Supplement on Windowing Environments and Applications

EDITED BY ROBERT LUHN **AND** ANITA AMIRREZVANI

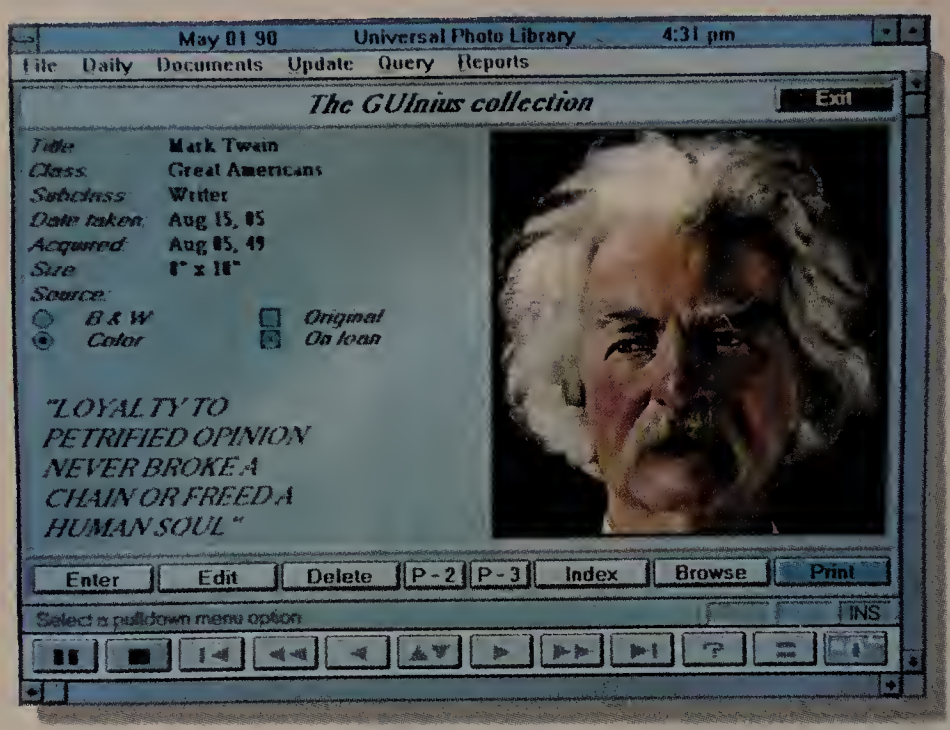
FEATURE

The Windows-Mac Connection
General Electric has installed tens of thousands of PCs and Apple Macintoshes. Companies big and small can benefit from GE's experience in getting these two species to work harmoniously. **150**

REVIEWS

The DeskTop Set 3.0 **154**
Spinnaker Plus 2.0 **155**
Ashlar Vellum for MS-DOS With Windows 3.0 **156**
PerForm Pro Designer and Filler **161**
Distinct Back-Up 2.0 **162**
Command Post 7.0 **164**
Windows Workstation Release 3 **166**

GUInius Database Solutions



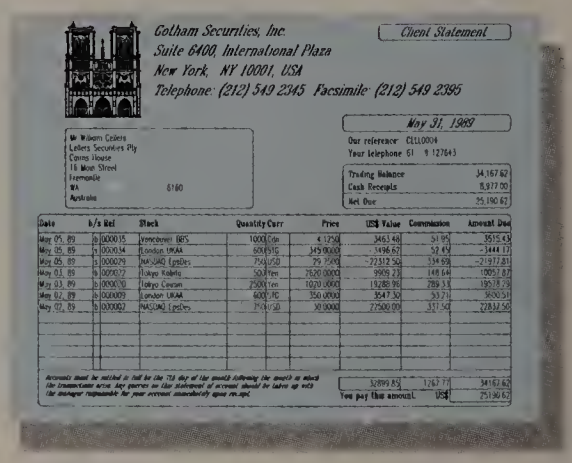
Design forms that integrate directly with the database. Use radio buttons and check boxes for clarity. Work with forms under pushbutton, pull-down menu or function key control.

Ease of learning. Elegance. Consistency. The benefits of graphical user interfaces (GUIs) are clear. And now with *Windows 3.0's* large memory space, you can switch between applications *instantly.*

Precision Software predicted the move to GUIs a long time ago; that's why we developed *Superbase 4*. It's simpler to learn than character-based systems, yet its potential for building integrated solutions leaves older development databases standing.

Accelerated learning

Superbase 4 gets you up and running quickly. Windows-style pull-down menus and pop-up dialogs give interactive access to a vast range of options. Import and export data in all popular formats; include images as data objects; print personalized letters and labels. And browse quickly through selected data using the intuitive VCR-style controls.



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Superbase 4's highly visual approach makes form design fun as well as productive. Create presentation-quality forms to integrate directly with the database or even with existing dBase® systems. Introduce logical objects like command pushbuttons to build up complete applications. The forms designer delivers concentrated development power, without programming.

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"Highly productive ... robust and powerful ... We rate the programming language excellent"

InfoWorld

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FEATURE

The Windows-Mac Connection

Hooking together PCs and Macs is never easy. Here's how GE is doing it—with a little help from Windows and its applications.

AT GENERAL ELECTRIC COMPANY, THE CORPORATE PERSONAL COMPUTING OBJECTIVE IS TO GIVE ALL DIVISIONS FREEDOM OF CHOICE OVER HARDWARE AND SOFTWARE WHILE ENSURING THAT THE RESULTING MIX OF MACINTOSHES AND PCS WORK TOGETHER IN HARMONY.

It's an ambitious goal.

Supporting both Mac and PC camps has required plenty of personnel, careful network implementation, and a number of resourceful file conversion schemes. Today, however, some forward-looking GE divisions are planning to lighten these burdens by adopting *Windows* equivalents of Mac applications.

Worlds Apart

In 1982, GE jumped on the IBM PC bandwagon in a big way. By 1984, when Apple introduced the Macintosh, GE had over 30,000 IBM PCs at sites around the globe. Yet despite this hefty installed base, the company allowed users to make up their own minds about what was the best computer for the job.

The result? GE's clerical staff overwhelmingly opted for the Mac, thanks to the machine's overall simplicity, especially in combining text and graphics for company publications. Many technology-shy executives also preferred the Mac's unintimidating graphical interface. According to Jeff Ehrlich, who directed the company's PC strategy at the time, users "didn't have to choose the Mac. On the other hand, if they did, they weren't considered outcasts." Ehrlich, who recently became vice president of technology for National Data Corporation, says GE currently has "tens of thousands" of Macs installed.

Meanwhile, IBM-compatible PCs remained more popular among GE employees who needed speed and power for heavy-duty computing—running complex *1-2-3* models, developing *dBASE* applications, and the like.

GE now had two different personal computing worlds—each with its own conventions, file formats, and training requirements.

The Path to Integration

The process of bridging the two technologies was indirect at first—GE's systems support personnel began by linking both Macs and PCs to the host mainframe. Next, in-house programmers wrote file transfer utilities to allow users to move data seamlessly between the most popular applications: *1-2-3* and *Excel for the Mac, OfficeWriter* and *Word for the Mac*. Additionally, the company installed low-cost *TOPS* networks, which can use both Macs and PCs as nodes.

Some GE offices began using *LapLink* and *MacBridge* to transmit files between PC laptops and Macs. Newer Macs were purchased with Superdrives, which can read and write disks in either DOS or Mac format.

Most recently, some GE divisions are looking seriously at *Windows* versions of Mac applications. One example is GE's Medical Systems Division, which

ALICE LAPLANTE

GORDON STUDER

'WINDOWS—ESPECIALLY WITH ALL THE TOOLS AVAILABLE TODAY —ULTIMATELY MAKES MAC COEXISTENCE MUCH EASIER.'

is analyzing the impact of moving all its DOS users to *Windows* applications running under *Windows 3.0*. There are 2700 PCs and 700 Macs at this division, and the goal is to have them all using Mac and PC versions of the same software to consolidate support staffs and reduce training costs.

Currently, the project is stalled for lack of an appropriate *Windows* data base. For now, the division will continue to support both DOS and Mac users. But "we would really like to move everyone to *Windows* applications and eliminate the need to convert files," says B. J. Hood, a GE technology analyst. "The time and energy it takes can then be channeled into other activities."

Ehrlich agrees. "Transferring files between *Word for Windows* and Macintosh *Word* is much easier than it is between the PC version of *Word* and Macintosh *Word*," he points out.

The fact that many Mac applications, such as *PageMaker*, *PowerPoint*, and *Persuasion*, are now available under *Windows* makes the *Windows* environment even more attractive. "*Windows*—especially with all the tools available today—ultimately makes Mac coexistence much easier," says Ehrlich.

Skirting the Obstacles

No one expects the path to *Windows* to be a cakewalk. One problem is that putting together a complete business system under *Windows* often involves "hacking together" products that don't work smoothly—and that increases costs. "Take fonts," says Ehrlich. "On the PC, fonts are a separate product, unlike on the Mac. You need to buy yet another product and try to get it to work with your existing applications."

Training DOS users on *Windows* "is as much work as simply moving them to the Mac," says Ehrlich, who believes that *Windows* is more difficult for the average user to understand than the Mac approach.

However, after training has been completed on basic *Windows* applications, supporting an environment with both *Windows* and the Mac is much easier than supporting DOS and the Mac, says Ehrlich. That's because "everyone is using a mouse, everyone is looking at icons, and everything works approximately the same."

The Payoff for GE

At a time when many organizations are only beginning to look at graphical user interfaces, GE's long-standing policy of letting Macs in the front door has forced it to grapple with training and compatibility issues early.

For Ehrlich, the Mac still offers the graphical environment of choice. But for many GE divisions and businesses with large PC investments, *Windows* is a better solution. By encouraging people to use the same applications across *Windows* and Mac platforms, GE is on the road to solving the training, user support, and file sharing challenges that come with freedom of choice.

Alice LaPlante is a freelance writer in Palo Alto, California, who specializes in technology issues.

Searching for PC-to-Mac Solutions?

Here's a list of 14 popular Windows products you can use on both platforms.

Company	Product	PC price	Mac price
Adobe	Adobe Illustrator	$495	$495
Aldus	PageMaker	$795	$795
	Persuasion	$595*	$495
Ashlar	Ashlar Vellum	$1995	$1995
Computer Associates	CA-Cricket Graph	$195	$195
	CA-Cricket Presents	$495	$495
Informix	Wingz	$499	$399
Microsoft	Microsoft Word	$495	$395
	Microsoft Excel	$495	$395
	Microsoft PowerPoint	$495	$395
	Microsoft Project	$595	$595
Softview	MacInTax	$99	$99
Spinnaker	Spinnaker Plus	$495	$495
Xerox	Ventura Publisher	$895	$795

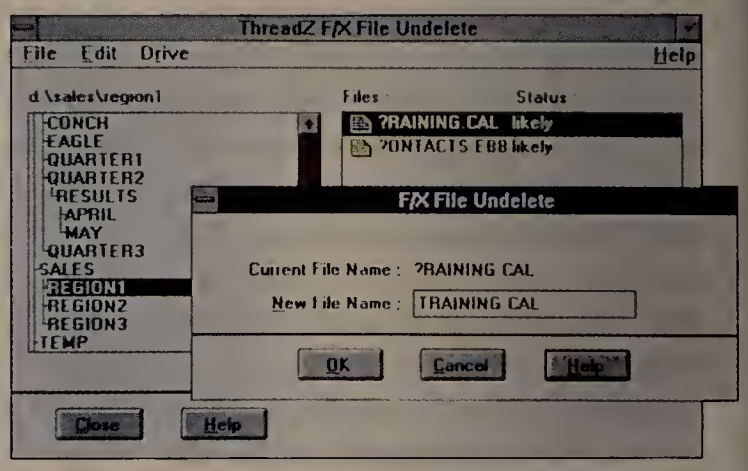
* Forthcoming.

Finally...File F/X!

Windows™ utilities that really work...

Introducing ThreadZ™ File F/X, the high-powered utility software that delivers on the Windows promise. File F/X transforms Microsoft® Windows 3.0 into the fast, flexible environment you've been waiting for. It combines that familiar Windows look with vital file management capabilities you can rely on! We think you'll agree. It's simple. It's sensible. And it works the way you do.

ThreadZ Task Manager. A nimble alternative to the Windows Program Manager. Launch applications, arrange windows, work with File F/X tools, and maneuver effortlessly between tasks. Add your favorite applications to a handy menu. It even remembers the last twenty things you did. And you get a nifty Screen Saver — choose your own graphics!



F/X File Manager. Combine the power of DOS file management with the convenience of Windows menus and dialog boxes. Use F/X File Manager to copy, delete, rename, or move both files and directories — on one hard disk or a whole network! It even takes the mystery out of changing file attributes! The unique "directory tree" display gives you complete file and directory information at a glance and lets you start applications without a fuss. Count on F/X File Manager when you need to streamline complex file managment tasks. Or use it as your Windows shell! And for even more power, paste F/X File Find and F/X Text Search results into F/X File Manager. Gather your project files into one directory, copy scattered files to multiple floppies, back up data, or delete old files. The possibilities are endless!

PLUS! The File F/X Tools.

Use the F/X tools together — or a la carte — to get your work done without getting a workout!

F/X File Undelete. Your chance of recovery is better with F/X File Undelete than any other Windows file recovery utility — and you don't have to be a hacker to use it!

F/X File Find. Use F/X File Find to locate one file fast. Or define multiple search paths, date criteria, and DOS wildcards to search for groups of files on one or more hard disks, or an entire network.

F/X Text Search. Search for just one document that contains a key phrase, or examine an entire hard disk in seconds. Do a quick search, get a complete report of every text occurrence, or load the file to take a quick look.

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GUESS WHICH MANAGER HAS CHARISMA

What's most important about a business presentation is how good you look after everybody else has finished. No matter what you know, it's how well you've communicated that usually determines your success. That's why you need Charisma.

Charisma is a complete graphics program for business, combining text charts, graphs, and drawing tools in one powerful package. Switch to Charisma and you can stop switching back and forth between all the other programs to get what you need. Now it's all at your fingertips.

The time and energy you save can be used to refine your presentation. And think of the time your work group will save by only having to be proficient with a single easy-to-learn graphics program.

Another clear advantage is Charisma's compatibility with Windows 3.0 which conveniently pops hundreds of options on the screen for rapid experimentation. Browse through chart types, clip art, 42 outline typefaces, perspective chart effects, colors, gradients, chart templates, and free form layouts, to name a few.

Charisma also includes drawing tools that will help the beginner and offer the power user maximum control. So finding the combination that gives your presentation the right snap will be quick and easy.

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REVIEW

DeskTop Set 3.0

Personal Information Manager

MANY NEW PROGRAMS FOR *WINDOWS 3.0* TAKE ADVANTAGE OF THE ENVIRONMENT'S COLORS, 3-D BUTTONS, AND OTHER NICETIES, BUT FEW ADOPT *WINDOWS'* INTERACTIVE, INTEGRATED WAY OF DOING THINGS. OKNA'S *DESKTOP SET* IS AN EXCEPTION. NOT ONLY DOES IT WIN THE MOST ATTRACTIVE PIM award, it's also easy to use because it seamlessly links a phone book, a calendar, an auto-dialer, and other tools. You can drag an entry from the phone book into the calendar, for example, or pop up the dialer in either utility.

DeskTop Set is not for professionals who track a lot of calls or projects by the hour or who need custom data entry forms. That's a job for IBM's *Current.* But if you juggle contacts and appointments and make a lot of phone calls—and if you don't want to hassle with defining fields, setting up links, or plowing through 700-page manuals—*DeskTop Set* is ideal.

DeskTop Set's centerpiece is the phone book, which comes complete with mouse-clickable letter "tabs." Each line can hold a single name and phone number, but a few mouse clicks can summon almost any type of information on your contacts: up to six phone numbers, home and business addresses, and notes for each entry. You can also attach reminders and alarms.

To reach out and touch someone, just double-click on a phone number. Check the phone log after you've dialed, and you'll find that *DeskTop Set* has already filled in the person's name and number, date-stamped the record, and set the timer running. There's even room to take notes. The dialer can handle PBXs and credit card numbers, and there's even a pop-up box that lists area codes around the country. However, the dialer has room for only 105 phone numbers.

DeskTop Set's more robust calendar is also a winner. Double-click on any day in the monthly or yearly views, and up pops a daily schedule in which you can enter appointments, schedule recurring appointments, and set alarms and reminders. Color-coded time lines display free time, and you can even call up a bar chart that pinpoints free time for the entire month. Double-click on a block of time, and you'll be transported to that day's schedule. A daily to-do list has also been integrated into the program calendar.

Still, there's room for improvement. The user manual fails to note some handy program shortcuts, and the index misses some items, and references others incorrectly.

BEST BUY

PROS: Excellent scheduling capabilities, tightly integrated modules, full-featured phone book and auto-dialer, superb calculator, easy to learn

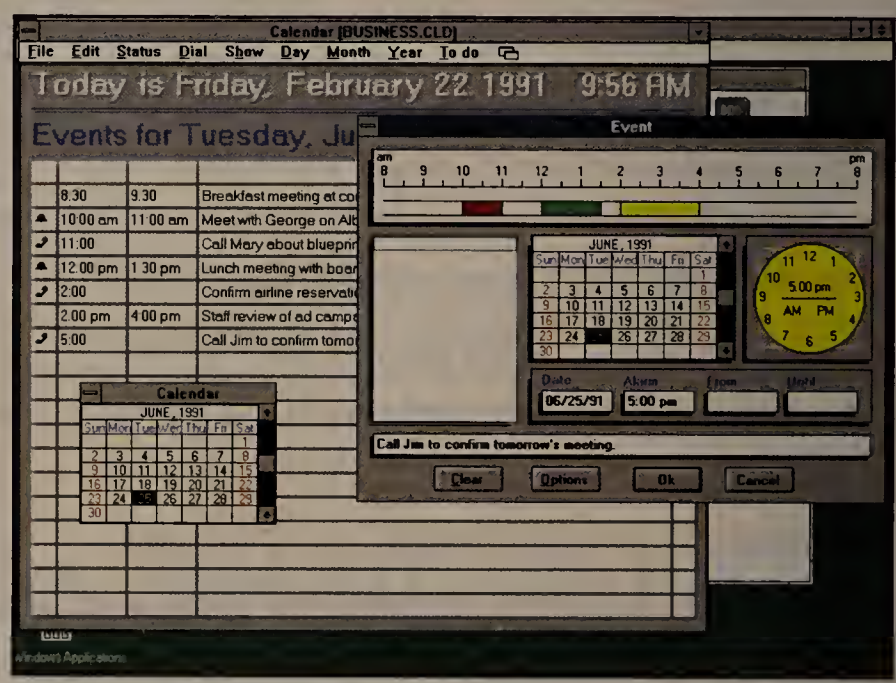
CONS: Lacks user-definable fields; no expense, time, or project tracking

WHERE TO BUY

The DeskTop Set 3.0
Okno Corp.
P.O. Box 522
Lyndhurst, NJ 07071
201/460-0677, 201/507-8725 (fax)
LIST PRICE: $149
REQUIREMENTS: IBM AT, PS/2, or compatible; Windows 3.0 or later version; 1.2MB of free hard disk space; VGA, EGA, Hercules, or 8514/A graphics card; mouse or other pointing device
TECHNICAL SUPPORT: unlimited, toll number, M–F 9–5
OTHER SUPPORT: none
Reader service no. 605

DeskTop Set's pluses far outweigh the minuses. It's the easiest PIM on the block to learn, yet the attractive phone book, dialer, and calendar are far more complete than *Current's.* If you need a no-muss, no-fuss personal productivity tool, *DeskTop Set* is your Best Buy.

Patrick Marshall writes for Congressional Quarterly's Editorial Research Reports *in Washington, D.C.*



DeskTop Set provides daily schedules as well as monthly and yearly calendars. At any time, you can summon a small "navigator" calendar and jump from one day to another. With the Event editor, you can set alarms and view free time.

GORDON STUDER

PATRICK MARSHALL

R E V I E W

Spinnaker Plus 2.0

Application Development Tool

SPINNAKER *PLUS* IS A *HYPERCARD*-TYPE DEVELOPMENT TOOL THAT'S TAILOR-MADE FOR MULTIPLATFORM CORPORATE ENVIRONMENTS. DESIGN ONE *PLUS* APPLICATION, AND ALL YOUR *WINDOWS*, OS/2, AND MACINTOSH USERS CAN RUN IT—PROVIDED THEY HAVE THE APPROPRIATE VERSION OF *PLUS*.

Like *HyperCard* and its kin, *Plus* is essentially a graphical flat-file data base. The central metaphor is the stack, which holds a data base of cards (akin to records). Each card can hold text, bitmapped and vector graphics, and a variety of field types, including masked, calculated, and scrollable fields. Better still, you can write a script and attach it to a button, field, or other object on a card so that when clicked, it fetches data or graphics, displays another card, or performs other operations.

Creating basic cards and stacks is relatively easy. Dig through *Plus*'s menus and icon-bar toolbox, and you'll find predesigned buttons, fields, and clip art that you just place on the page, as well as complete draw and paint modules and commands that quickly link cards. Pick the appropriate tool, and *Plus* switches to the proper mode for entering data or fiddling with graphics. It's not the most intuitive process in the world, but most *Windows* users will pick up the conventions quickly.

Although nonprogrammers can create schedulers, to-do lists, organizational charts, and similar applications by pointing and clicking, building interactive applications, creating hypertext links, or using animation effects means writing scripts in the Plus Programming Language (PPL). Like HyperTalk, PPL is easier to grasp than Pascal or C, but English it ain't.

For anyone with basic programming skills, however, PPL should not be too intimidating. *Plus* includes on-line help, language references, sample stacks, and a script editor that lets you insert functions, commands, and program structures from handy menus. But there's no *Toolbook*-like script recorder, so you can't record actions for a button and then generate a ready-made script.

And *Plus* is slow—an 80386 PC is a must. Though the *Windows* version of *Plus* can use *HyperCard* stacks, you must first convert them with the Macintosh version of *Plus*. *Plus* doesn't support Dynamic Data Exchange (DDE), either, so stacks can't maintain hot links to data in other *Windows* applications.

Plus is relatively easy to learn, but its $495 price tag and multiplatform approach make it most appealing to corporate software developers. If you've been putting off writing *Windows*, OS/2, and Macintosh applications, *Plus* just may be the tool for the job.

Scott Spanbauer is a contributing editor for PC World.

PROS: Easy HyperCard-like programming; interoperability between Windows, OS/2, and Macintosh versions; Windows version can use HyperCard stacks via Macintosh version; built-in paint and draw features

CONS: No script recorder or DDE support, RAM-hungry, slow

WHERE TO BUY

Spinnaker Plus 2.0
Spinnaker Software
201 Broadway
Cambridge, MA 02139-1901
800/826-0706, 617/494-1200
LIST PRICE: $495; run-time kit (unlimited copies) for one platform $495, for two platforms $900, for three platforms $1250
REQUIREMENTS: 2MB of RAM, hard disk, 80286 or faster PC, DOS 3.1 or later version, Windows 3.0
TECHNICAL SUPPORT: unlimited for 90 days after first call, toll number, M–Th 10–5, F 10–4:30
OTHER SUPPORT: 900 number; annual developer's contract $250
Reader service no. 607

This currency-conversion stack demonstrates the capabilities available in Spinnaker Plus with minimal scripting. Enter the number of deutsche marks or dollars, click on the arrow to set the direction of the conversion, and hit the Calculate button. The buttons at upper right summon Plus's bundled stacks, such as a world clock.

SCOTT SPANBAUER

REVIEW

Ashlar Vellum

Computer-Aided Design Package

AT FIRST GLANCE, *ASHLAR VELLUM* MAY SEEM LIKE JUST ANOTHER TWO-DIMENSIONAL DRAFTING PROGRAM, BUT CLOSER EXAMINATION REVEALS A PROGRAM THAT GOES WELL BEYOND AUTOMATING COMPASS AND T SQUARE—AND SUGGESTS THE FUTURE OF "INTELLIGENT" SOFTWARE INTERFACES.

The key part is *Vellum*'s Drafting Assistant, which anticipates your need for construction lines, or for a "snap to" to other objects like centers, tangents, and midpoints. These aids pop up as you move the pointer, whether you're drawing a new element or editing an existing one. What's amazing is that the Assistant is usually right, easy to override, and unobtrusive.

Vellum's other claim to fame is dimension-driven parametrics. You can rough out designs, then modify the dimensions in a table, and *Vellum* will change the drawing to reflect the new values. Though this is a very powerful tool for iterating a design or drawing variations, *Vellum*'s parametric engine needs some tuning. Parametric programs require an "unambiguous" model definition, but *Vellum* doesn't tell you if there are too many, too few, or conflicting constraints.

Vellum comes with the usual set of drafting tools, such as fillets, chamfers, linear and polar pattern copying, and ellipses. Advanced drafting features include NURBS (nonuniform rational B-splines), associative dimensions, "smart" crosshatching, and geometric tolerancing.

Vellum is well suited to designing mechanical components, but architects, civil engineers, and electronics designers should look elsewhere. Part of the problem is that you can't customize *Vellum* for different disciplines, work styles, or drafting practices or to automate repetitive tasks. Text and numeric engineering data (attributes) can't be associated with objects, so you can't extract bill-of-material lists or engineering data.

If you are used to *AutoCAD*, such limitations may seem prohibitive. But try *Vellum*, and you may find its elegant interface and mind-reading features irresistible. It cannot (yet) match the power of an *AutoCAD*, but every design professional should take a close look to see what the future holds.

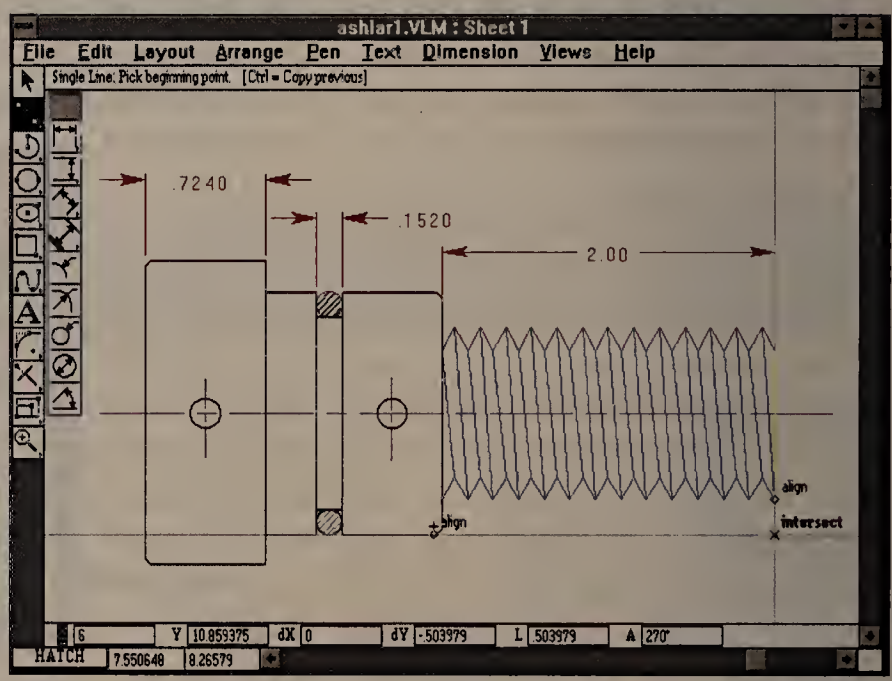
Christopher James DeLucchi is the author of The AutoCAD Cookbook *series (John Wiley, New York, 1989) and chairperson of the AutoCAD Users Group of San Diego.*

PROS: Superb interface, dimension-driven parametrics, associative views, geometric tolerancing, fair range of math functions

CONS: Can't be customized, no 3-D modeling, no ordinate dimensioning, limited error handling

WHERE TO BUY

Ashlar Vellum for MS-DOS With Windows 3.0
Ashlar Inc.
1290 Oakmead Pkwy. #218
Sunnyvale, CA 94086
408/746-3900, 408/746-0749 (fax)
LIST PRICE: $1995
REQUIREMENTS: 80386 or faster PC, math coprocessor, 2MB of RAM (4MB recommended), 5MB of disk space, Windows 3.0, DOS 3.1 or later version, EGA or better graphics, mouse
TECHNICAL SUPPORT: unlimited for one year
OTHER SUPPORT: $95 for extended support, including 800 number and technical tips
Reader service no. 609



Vellum's Drafting Assistant anticipates relationships to other geometric features as the pointer is moved. In this shot, construction lines are automatically displayed when the pointer is next to objects you are likely to align with.

GORDON STUDER

CHRISTOPHER JAMES DELUCCHI

Here's what they're saying about Ami Pro from Lotus.

"Independent User Survey For Windows.™*"

Word Processing Features	Ami Pro *for Windows*	Word for Windows	WordPerfect for DOS
Best Overall	50%	22%	16%
Ease of Learning	47%	28%	8%
Ease of Use	52%	23%	8%

*Independently commissioned Windows word processor Usage and Attitude Study conducted November 1990

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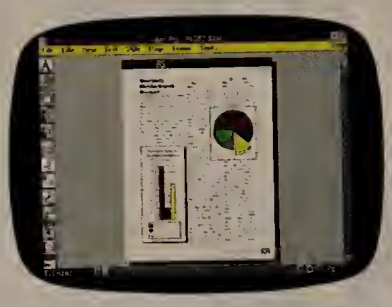
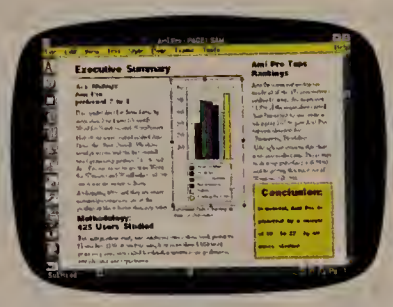
Here's why th



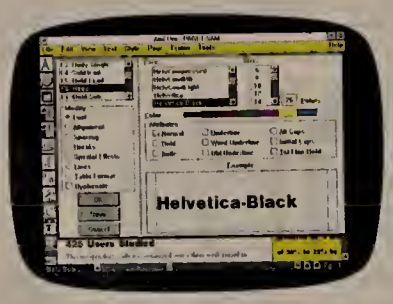
WYSIWYG

No wonder Ami Pro™ for Windows™ is getting rave reviews from users. They're naturally impressed by its 360 powerful features. And even more impressed with how easy it is to use them. Ami Pro has everything you expect in a power word processor, plus important features you can't find anywhere else—like truly interactive WYSIWYG that lets you edit in any of four page views, including full-page view.*



FRAMES

Our exclusive "frames" feature lets you quickly place text and graphic elements where you want. Just position your frame anywhere on the page, then fill it with words, drawings or imported graphics. With a click of the mouse, your text automatically wraps around it.



DIALOG BOXES

Why settle for difficult programs that produce boring documents? Our friendly, interactive Dialog Boxes display all your layout options—and show you the results of commands before you execute them. So you can change your mind without wasting time.

CHARTS AND GRAPHS

In addition to a built-in drawing feature, Ami Pro instantly generates 168 varieties of presentation-quality charts and graphs, including 2-D, 3-D and perspective. Just type in the data, or import your chart information from programs like Lotus® 1-2-3.®

3RS

M E M O R A

To: Lotus Development Word Processing

From: BRS Research Services, Inc.

5, 1990

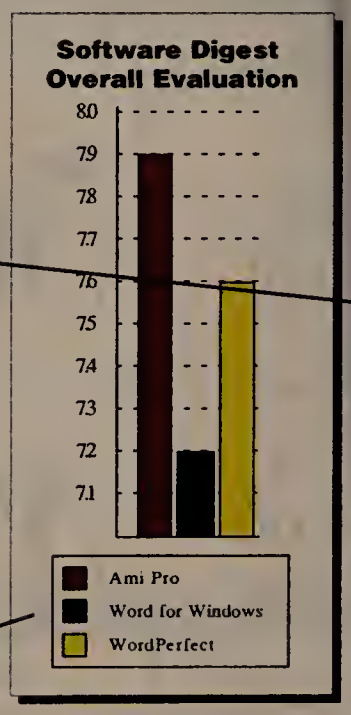
3RS

User Study Matches Expert Reviews

User preference research findings have a uncanny resemblance to what word processing and technology experts have been saying all along: Ami Pro is the new standard for word processing in the Windows environment.

The Software Digest rating, for example, places Ami Pro well above Microsoft's Word for Windows and WordPerfect in terms of overall performance.

The user research shows similar results. Ami Pro consistently outranked Word for Windows and WordPerfect in terms of



3RS

USER
WORD P

Executive Su

Key findings:
Ami Pro preferred 2 to 1

Users prefer Ami Pro from more than 2 to 1 over Mi Word for Windows and W

Half of the users studied Ami Pro as the "Best Ov Windows word processo overall word processing 51.9% said Ami Pro wa than Word for Window WordPerfect; 47.3% sa easiest to learn.

A whopping 63% said extremely enthusiastic product or like it bette

Methodolog

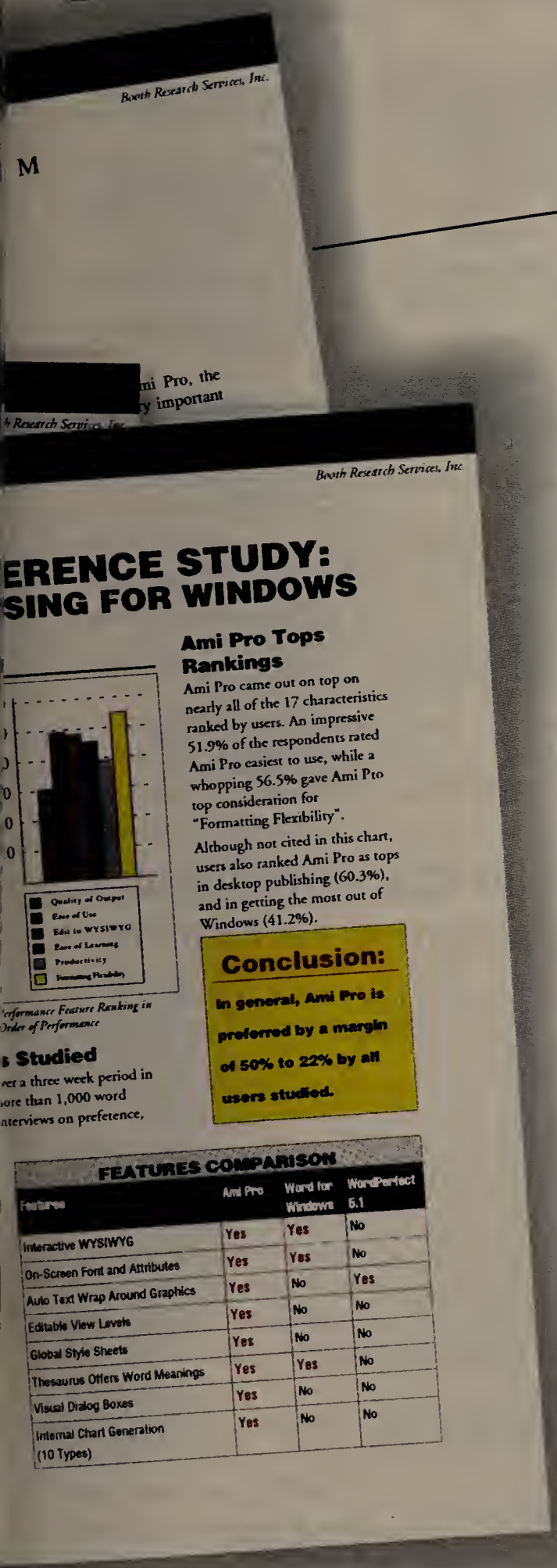
This independent stu November, 1990. A processing users were attitudes and user ex

Ami Pro
Word for Window
Don't Know
WordPerfect

Easiest

*Study results and complete questionnaire available by writing Booth Research Services, Inc., 1120 Hope Road, Suite 200, Atlanta, GA 30350. Enclose $100 plus $3.00 shipping and handling.

ey're saying it.



Features	Ami Pro	Word for Windows	WordPerfect 5.1
Interactive WYSIWYG	Yes	Yes	No
On-Screen Font and Attributes	Yes	Yes	No
Auto Text Wrap Around Graphics	Yes	No	Yes
Editable View Levels	Yes	No	No
Global Style Sheets	Yes	No	No
Thesaurus Offers Word Meanings	Yes	Yes	No
Visual Dralog Boxes	Yes	No	No
Internal Chart Generation (10 Types)	Yes	No	No

STYLE SHEETS

Ami Pro comes with more than two dozen style sheets that have the page layout already set up and ready to go. So you can produce professionally designed business letters, memos, reports, presentations, newsletters and more—in just the time it takes to type in text.

It's easy to see why users prefer Ami Pro from Lotus two to one over Microsoft® Word for Windows™ for overall features and ease of use. And why it's received top ratings from virtually all the industry experts, racking up such coveted awards as PC World's Best Buy. The Buyers Assurance Seal from InfoWorld. And PC Magazine's Editor's Choice.

"Ami Pro received a score in Ease of Use of the User Interface that was fully 10 points higher than the next highest score, and came in 14 points ahead of the score WordPerfect™ 5.1 drew from its buyers," according to PC Week's Corporate Satisfaction Poll.

PC Magazine says, "Ami Pro has the friendliest interface and the widest range of functions...[It] is easier to use than almost any program with comparable powers."

Ami Pro is the word processing program that takes full advantage of the Windows environment, combining power word processing with the power to create professional documents fast. And with its icons and interactive features, Ami Pro is incredibly easy to learn and use. So what do you say? You've just learned about five major Ami Pro features.

Now to find out about the other 355—and how to get a free working model—turn the page.

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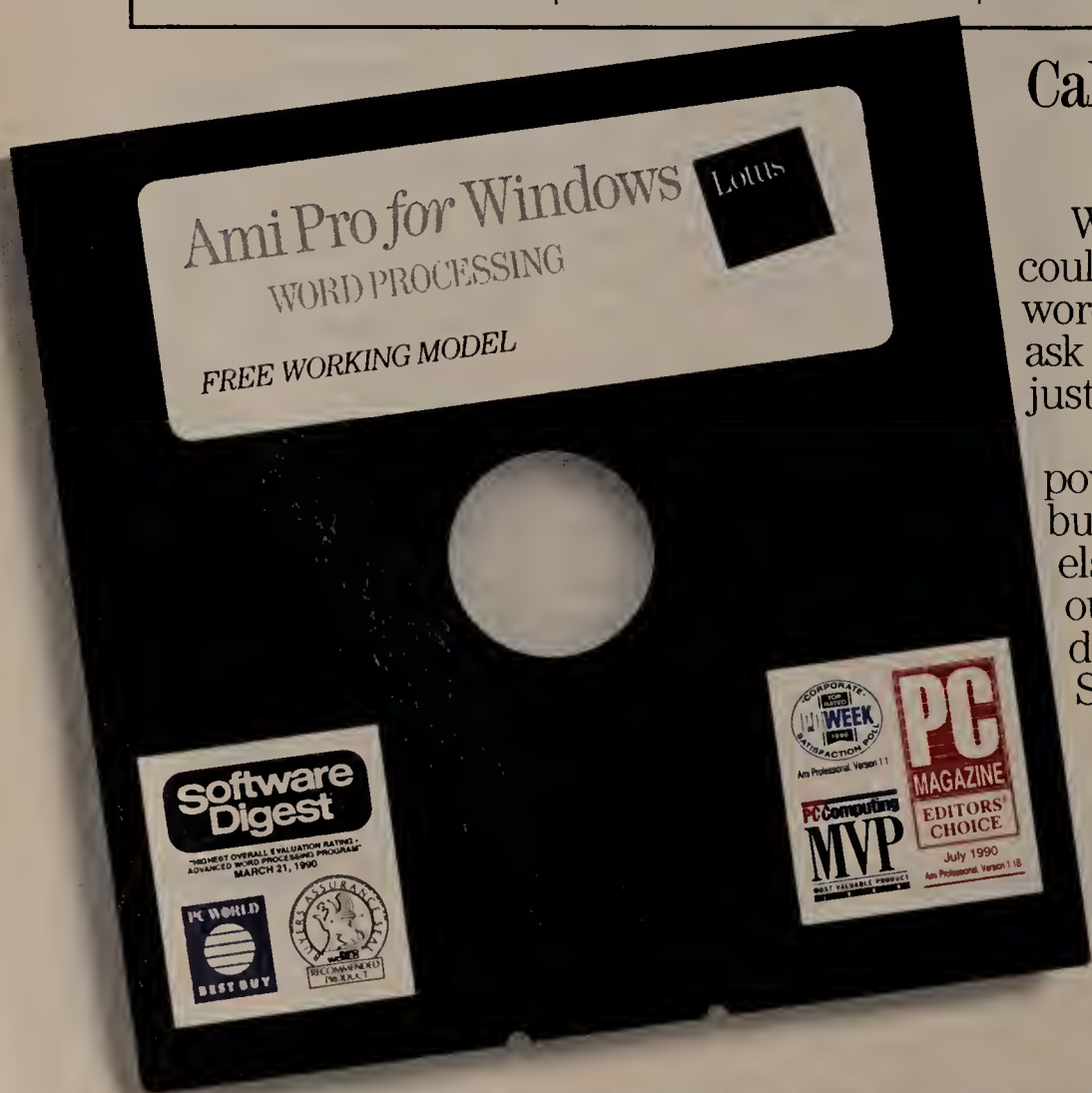
This says it all.

Automatic Backup
Automatic Timed Save
Block Manipulation
Bookmarks
• Named By User • Go To
Charting
• 3D Charting • Edit Chart with Draw Tools • Legends • Multiple Styles Per Type • 7 Chart Types
Copy Text and Graphics
Cursor Movement
• Begin/End of File • Character • Line • Page • Paragraph • Sentence • Top/Bottom of Screen • Word
Customizable Icon Bar
• Choose From Over 45 Functions • Quick Access to Features
Customizable View Level
• 10-400% • Fully Editable
Cut and Paste
Date Insertion
• Today's Date • Date Printed • Date Last Edited • Definable Style
DDE (Dynamic Data Exchange)
• Two-way • Paste Link • Text and Graphics • Via Macro Language
Defaults
• Backup Options • Date Styles • Dictionary Paths • Display Options • Document Path • Draft Mode Colors • Footnote Options • Hyphenation Hot Zone • Pair Kerning • Printer • Icon Bar Icons • Undo Levels • View Level
Delete
Dialog Boxes
Document Annotation
• Notes • Show/Hide • Go To Notes • Date/Time Stamp • Stacked Notes
Document Descriptions
• Author Name • Operator Name • Revision Number • Creation Date • Revision Date • Renameable Fields • User Defined Fields • Display with Directory • Print with Document
Drawing
• Cut/Paste Objects • Circles • Arcs • Squares • Rectangles • Rounded Boxes • Diagonals • Polygons • Polylines • Group Objects • Snap-To Grid • Fill Patterns • Line Widths • Text Rotation • Type Text
File Import/Export
• AdvanceWrite • ASCII • DBase • DCA Final Form • DCA Revisable Form • DIF • E-Mail • Enable • Lotus WKS, WK1, WK3 • Microsoft Word • Microsoft Word for Windows • Multimate • Navy DIF • Peachtext • Rich Text Format • Samna Word • Windows Write • WordPerfect • WordStar • Wordstar 2000
File Management Functions
• Copy • Rename • Delete • Move • Sorted File Listing
Font Control
• Unlimited Number of Fonts • WYSIWYG • Limited Only by Printer
Footnotes
• Auto Numbering • Bottom of Page • Endnotes • Number Style Option • Reset Number Option • Separator Line
Forms Capability
• Format Complicated Forms • Fill-In On-Screen • Print on Preprinted Form • Protect Areas
Frames
• Anchor to Text • Auto Text Wrap Around • Background Shade • Contain Text or Graphics • Fixed Position On Page • Lines Around • No Text Wrap Around • No Text Wrap Beside • Overlay Frames • Repeat on Multiple Pages • Resize Frames
Glossary
• Large Record Size • Speed Key Access
Go To
• Any Page Number • Fast Next Item Access • Go To Frame, Footnote, Note, Various Marks in Document
Graphics Control
• Edit PIC Files • Drop Anywhere on Page • Float Graphic w/Text • Place in Box • Proportional Scaling • Fit in Frame • Rotate in Single Degree Steps • X-Y Scaling • Gutter/Binding Margins
Graphics Import
• CGM • EPS • HPGL • Lotus PIC • PCX • TIFF • WMF
Hard Space
Headers/Footers
• Alternating • Floating
Help
• CBT Tutorial Available • Context-Sensitive • Indexed • Point & Shoot • Hypertext Linked • Full Macro Documentation On-Line
Hyphenation
• As-You-Type • Soft Hyphen • Consecutive Hyphen Control • On Paragraph Basis • Hot Zone
Image Processing
• Control Brightness, Contrast of Scanned, Gray Scale TIFF Pictures • Sharpen Edges • Smoothing • Invert Image
Index Generation
• Generate from List • Mark in Text • Multiple Level Indexing • Hyper Links from Index Back into Document
Insert/Typeover
Kerning
Line Numbering
Line Spacing Control
Macros/Programming Language
• On-Line Macro Documentation • Record/Play • Assign to Function Key • Assign to Menus • Create Menus • Variables • If • Go To Statements • Case Statements • For/Next • Prompt for Input • Subroutines
Math Calculations
Measurements
• Centimeters • Inches • Picas • Points
Merge
• From ASCII Files • From Comma Delimited Files • From DIF Files • From WK* Files • From dBase Files • From Ami Pro File • Label Print Function • Preview Before Print • Three-Level Boolean Conditional Record Inclusion
Open Multiple Documents
Page Breaks
• Manually Inserted • With Paragraph Style
Page Formatting Control
• Margins • Page Size • Snaking Columns • Line Around Page • Line Between Columns • Portrait/Landscape
Page Numbers
• Any Location on Page • Reset Page Number • Five Formats for Number
Paragraph Styles
• Quick Access with Styles Box • With Function Key • Controls: Font, Alignment, Spacing, Page Breaks, Ruling Lines, Bullets, Numeric Format in Table, Hyphenation
Printing Color
Print Options
• Over 130 Printers Supported • Number of Copies • Page Range • Reverse Order • Collate • Print Document Description • Crop Marks • On Preprinted Form • Printer Bin Control for First/Rest Pages • Portrait or Landscape
Real-Time Pagination
Revert to Saved Version
Search and Replace
• Case Insensitive • Forward or Backward • Header/Footer/Footnote • Skip • Replace • Replace All • Search for Style • Search by Attribute • Wildcards
Section Outline Numbering
• 6 Levels • Number Paragraphs • Numbered Lists • User-Defined Reset
Snaking Columns
• Up to 8 Columns • Column Balancing • On Screen • Variable Width • Variable Spaced
Sort
• Alphabetic • Numeric • Ascending • Descending • By Paragraph • By Word • By Number of Lines • 3 Levels—3 Words Within each Level
Spelling Check
• 130,000 Word Dictionary • Add to Dictionary • Correct Multiple Occurrences • Entire Document • Selected Text • International Dictionaries • Rest of Document • Skip All Occurrences • Statistics Report • Unlimited User Dictionary Size
Status Line
• Column Number • Document Name • Insert/Typeover • Line Number • Page Number
Style Sheets
• 27 Professionally Designed • Control All Formatting in Document • Document-Only Styles • Global Styles
Tables
• Up to 256 Columns • Column Width Control • Row Height Control • Auto Row Height • Lines around Cells • Shaded Cells • Connected Cells • Formulas: Four-Function Math, Sum Function, Absolute/Relative Cell Address • Insert Rows and Columns • Numeric Alignment and Formatting
Table of Contents
• 3 Levels • Separator Choice
Tabs
• Center • Leader Dot • Left • Numeric • Right
Text Enhancements
• Bold • Double Underline • Initial Caps • Italic • Lowercase • Overstrike • Small Caps • Subscript • Superscript • Underline • Uppercase • Word Underline
Thesaurus
• 1.4 Million Alternatives • Definitions • Gives Inflections • Synonyms
Undo
• Four-Level • Customizable
Unlimited Document Size
Vertical Centering
Widow/Orphan Control
Word Count



Call 1-800-831-9679 for your free working model of Ami Pro.

With all these advanced features, you couldn't ask for a more powerful or easier to use word processor than Ami Pro. But you could ask for a free fully functional working model*—just by dialing our toll-free number.

Slip it into your PC, and experience the power of a serious word processor, plus built-in graphics you won't find anywhere else. Even if you don't have Windows yet, our working model with its own Windows driver will show you what you're missing. So call **1-800-831-9679** now.

Ami Pro™ *for Windows*™
from
Lotus®

Lotus Word Processing Division, 5600 Glenridge Drive
Atlanta, GA 30342, 800-831-9679, 404-851-0007

*Lacks some features including thesaurus, spell checker and ability to save files. InfoWorld's Buyers Assurance Seal awarded August 13, 1990 to Ami Pro 1.2.

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Circle 338 on reader service card

REVIEW

PerForm Pro Designer and Filler

Forms Creation Package

THE BUSINESS WORLD RUNS ON FORMS, FROM PINK TELEPHONE MESSAGE PADS TO BYZANTINE, MULTIPAGE GOVERNMENT DOCUMENTS. NOT SURPRISINGLY, ELECTRONIC FORMS PACKAGES ALSO RUN THE GAMUT, FROM CHARACTER-BASED FILL-IN-THE-FORM TOOLS LIKE *FORM FILLER* TO SOPHISTICATED FORM-ORIENTED DATA MANAGERS LIKE *FORMBASE*.

Delrina's *PerForm Pro* sits squarely in the middle. This jack-of-all-trades comes with 100 sharp-looking prefab business forms that you can easily modify, and you can create new forms in a snap. *PerForm Pro* can automatically fill in forms with ASCII or *dBASE* data, and it can even be used as a data entry front end for *dBASE*. If you need a forms package that covers all the bases, *PerForm Pro* is the ticket.

Building a form from scratch is pretty easy, thanks to some simple but sufficient draw tools. But most users will probably customize one of the many useful sample forms that range from shipping records to travel vouchers. You merely import your own logo (in PCX, TIFF, EPS, or GEM format), type over the text you want to change, and modify existing field types. Automatically filling in a field with data from a DBF file involves selecting a menu option or two, then inserting the exact name of the *dBASE* field. You can fill in whole sections of a form this way.

There are plenty of field format and data validation controls. You can insert calculated and logical fields, "mask" a field so that, for example, a date always appears in a MM/DD/YY format, and, if you use a form for data entry, force users to enter data in certain fields and lock them out of others. Users with the proper password can also issue forms with a previously scanned signature and verify that no one has tampered with a form or its data—a must for government users.

If you can't part with a preprinted form, don't fret. Run it through a scanner, import the TIFF image, and manually trace it with *PerForm Pro*'s draw tools. It's pretty easy to do.

LaserJet-printed forms come out fast and sharp; PostScript output is also snappy, but generating a complex form may take 30 minutes. Dot matrix output is fuzzy, and fonts are a mixed bag. *PerForm Pro* supports the LaserJet III and PCL 5, and it includes *Agfa Type Director* and Univers and CG Times typefaces. Unfortunately, Agfa's font generator can't scale fonts on the fly and eats up 2MB of disk space, and a single typeface (4 outlines) costs $99.

PROS: Easy forms design, automatically fills in forms with dBASE data, offers 100 sample forms, U.S. government version available

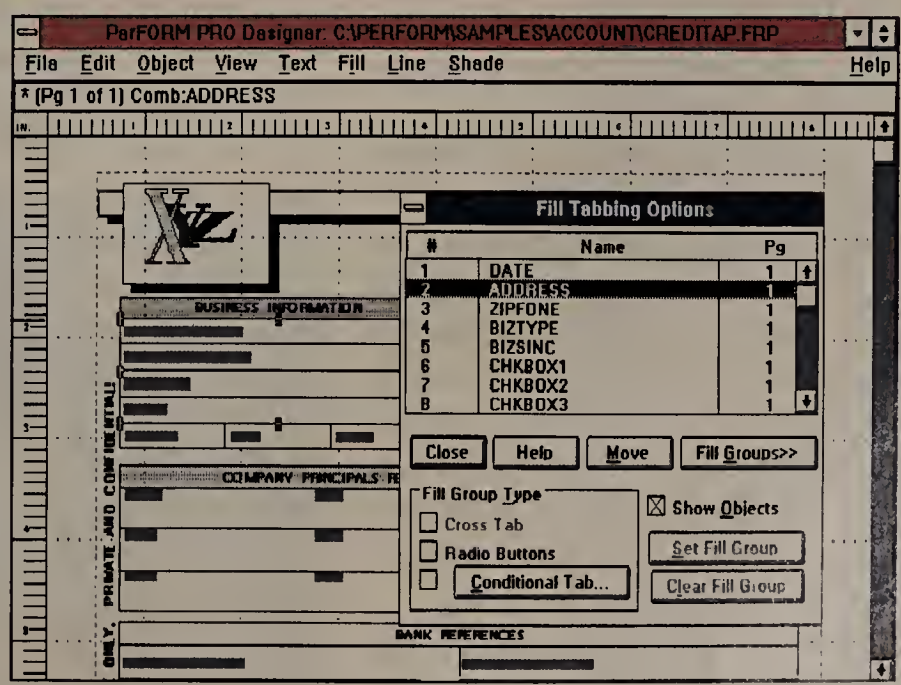
CONS: Confusing manual, poor dot matrix output, only two supplied fonts

WHERE TO BUY

PerForm Pro Designer and Filler
Delrina Technology Inc.
15495 Los Gatos Blvd. #8
Los Gatos, CA 95032
800/268-6082, 408/356-9570 (fax)
LIST PRICE: $495, upgrade for PerForm 2 users $99; DOD version $495
REQUIREMENTS: 640K, hard disk, DOS 3.1 or later version, Windows 3.0
TECHNICAL SUPPORT: unlimited, toll number, M–F 9–5
OTHER SUPPORT: fax support
Reader service no. 608

PerForm Pro is easy to use—but the manual, which assumes you're experienced with forms packages, needlessly complicates installation. Still, *PerForm Pro* lives up to its name. It's efficient, fast, and sharp. In short, *PerForm Pro* is a forms package for all seasons and easily earns a Best Buy.

Sarah Chambers is a technical support representative with 800 Software specializing in Windows *applications.*



PerForm gives you total control over a form's appearance, including the way data is displayed and what kind of data may be entered. Here, you can even specify where the cursor should move when the <Tab> key is pressed.

GORDON STUDER

SARAH CHAMBERS

REVIEW

Distinct Back-Up 2.0

Backup Program

BACKING UP A HARD DISK IS A PERFECT JOB FOR A MULTITASKING ENVIRONMENT LIKE *WINDOWS 3.0*, SINCE YOU CAN PERFORM THE DREADED CHORE IN THE BACKGROUND WHILE YOU WORK ON SOMETHING MORE INTERESTING. *DISTINCT BACK-UP*—THE FIRST BACKUP PROGRAM DESIGNED FOR *Windows 3.0*—does the job, and it includes a handy scheduler for running unattended backups to another hard disk or network file server. But if you work in both character-based and *Windows* environments, there are better backup bargains to be had.

Distinct supports all the standard backup options: full, incremental, differential, and full copy, and you can also select files by date range. It offers optional file compression, write verification, and password protection, but file compression is slow and inefficient. Also, there's no advanced error correction system for restoring data from damaged floppies.

Anyone who's familiar with *Windows* can master *Distinct* in short order. You open multiple directory windows and choose the drives, directories, or specific files to be included in your backup. As with *Norton Backup*, backed-up files can span multiple drives—a convenience for those with partitioned hard disks. If you run a backup behind another application, *Distinct* pops up a reminder asking for the next floppy.

When you complete a backup, the parameters are saved in a "project" file. For example, you might set up a project called *1991 Budget* that backs up all files concerned with your departmental budget. A project can be tied to specific drives, directories, file names, or wild cards (such as *.WK1). To run this backup later, simply select the project name from a dialog box.

A separate scheduler lets you specify unattended backups. Since you'd have to be around to change floppies, this feature is aimed at backing up to another hard disk or network drive. The scheduler can also remind you to perform a specific backup project—say, every Friday afternoon at 2 p.m.

In terms of performance, *Distinct* fared well in an informal comparison with Fifth Generation's *Fastback Plus 2.1*. With file compression and verification turned off for both products, *Fastback* took just under 6 minutes and required nine 1.44MB floppies to back up 11.3MB of files. Running as a foreground application, *Distinct* clocked in at a respectable 6½ minutes and used only seven floppies. *Distinct* ran almost as fast in the background.

But select *Distinct*'s file compression option, and backup time doubles, yielding only a modest 10 to 12 percent savings in disk space. Even worse, the option eats up so much CPU time that you probably won't want to run it in background mode.

Distinct Back-Up is a good choice for *Windows* users, especially if you want to run unattended backups. But if you need an all-purpose program that can back up any DOS or *Windows* system, a program like *PC Tools Deluxe 6.0* is a better backup buy.

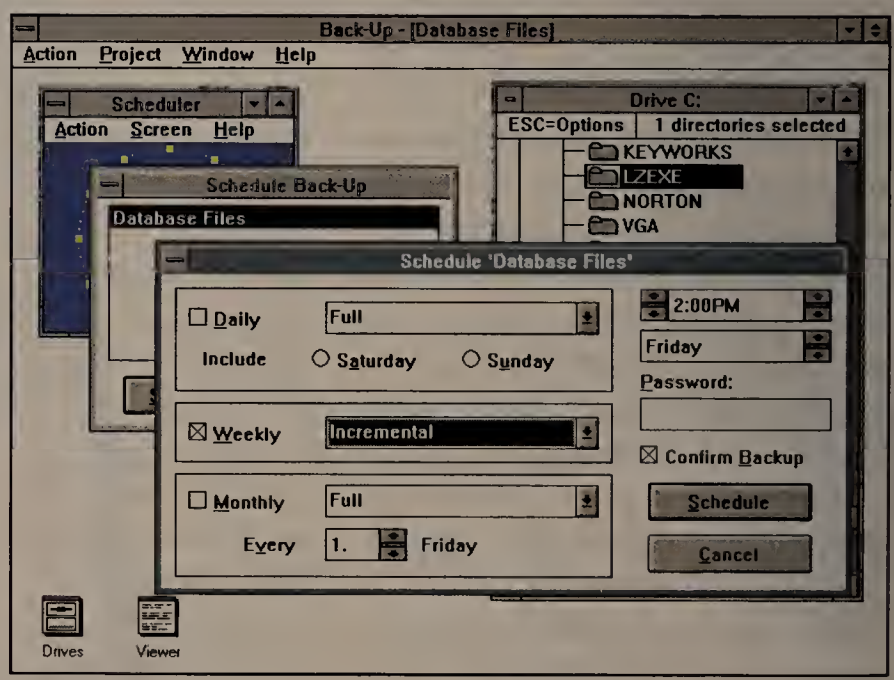
John Walkenbach is a contributing editor for PC World.

PROS: Full range of backup features; does unattended and background backups; easy to learn, relatively fast

CONS: File compression slow and inefficient; can't recover data from damaged disks

WHERE TO BUY

Distinct Back-Up 2.0
Distinct Corp.
P.O. Box 3410
Saratoga, CA 95070-1410
408/741-0781, 408/741-0795 (fax)
LIST PRICE: $129
REQUIREMENTS: 50K to 150K of RAM, Windows 3.0, DOS 3.1 or later version; mouse recommended
TECHNICAL SUPPORT: unlimited, toll number, M–F 8–6
OTHER SUPPORT: none
Reader service no. 611



Distinct Back-Up can schedule unattended backups (on another hard disk or server) or simply remind you when it's time to back up your files.

GORDON STUDER

JOHN WALKENBACH

EXTRA! EXTRA!

MoreFonts®

VOLUME 1 NUMBER 1 17 TYPEFACES AND MUCH MORE

Get More Fonts For Less

EMERYVILLE, CA—MicroLogic Software has released Version 2.0 of MoreFonts; its popular font design and generation program. MoreFonts helps you create thousands of typefaces for use with the most popular PC word processing and desktop publishing programs. It includes 17 typefaces with 40 symbol sets containing legal, international, and graphic characters. All font selections can be previewed on screen.

On-The-Fly Scaling

The new release adds "on-the-fly" downloading of fonts directly to your printer when using WordPerfect or Microsoft Word, to save hours of time and megabytes of disk space. "MoreFonts loads requested fonts directly into the LaserJet, thereby avoiding the hassle of selecting and making separate bitmapped fonts in advance," explained Frank Hainze, president of MicroLogic Software. "Just select any size font from within your application, choose the shading or special effect, and then print. MoreFonts provides more scaling capabilities than either a

LaserJet III or a PostScript printer — for all the HP compatible lasers."

Fonts for Windows 3.0

MoreFonts provides quick installation for WordPerfect 5.01/5.1, Microsoft Word 4.0/5.0, MultiMate 4.0, XyWrite III Plus, Xerox Ventura Publisher 1.1/2.0, First Publisher 2.0/2.1, and all applications under Windows 2.0/2.1/3.0 including PageMaker, Excel, Ami, etc. For Windows applications, Word Perfect and Microsoft Word, MoreFonts supports bitmap as well as scalable printer fonts, with matching screen fonts.

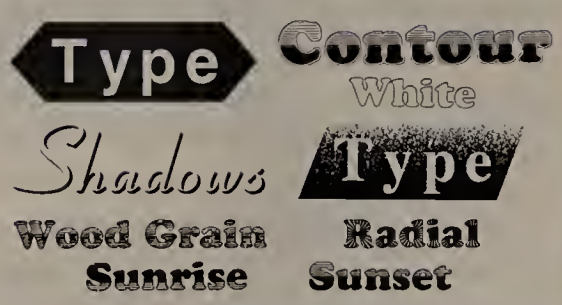
LaserJetIII Support

MoreFonts generates the largest fonts your printer can print (from 2 to 999 point) in the highest resolution possible (300 dpi) on the popular Hewlett-Packard LaserJet III, IIP and IID printers. It also supports the LaserJet Series II, 2000, Plus, 500 Plus, DeskJet, DeskJet Plus, and Dot-Matrix printers (for First Publisher). MoreFonts runs on any IBM PC, XT, AT, PS/2 or compatible with at least 384K bytes of memory, DOS 2.0 or later, and a hard disk.

Thousands of Special Effects On Exhibit

LOS GATOS, CA—Thousands of special effect fonts, created with MicroLogic Software's MoreFonts font generator, went on exhibit today.

"Once you've selected a typeface, you can specify over 50,000 combinations of point size, pattern, outline, shadow, orientation and symbol set," said Dick Brown, president of Brown-Wagh. "So when black type isn't enough, you can combine your choice of 6 outlines, 8 shadows, 27 fill patterns, and 28 background effects for eye-catching variety. You can use a touch of conservative gray or a splash of something really wild."



Critics Say "Thumbs Up" to MoreFonts

Dale Lewallen, PC Week
"MoreFonts could be a one-stop shop for most users. By providing automatic font installation for several different applications, a surfeit of special effects, 40 symbol sets and a good selection of typefaces, the package earns a high rating for value."

David Dean, PC Publishing
"MoreFonts wins on speed hands down. The typefaces included are comparable with typefaces costing more than eight times as much."

Mark Brownstein, InfoWorld
"Even if the fonts weren't so good, MoreFonts would be a great way to experiment with fonts. With the outstanding quality, it's an even better deal."

David Dean, PC Publishing
"Finally the ease of use of MoreFonts should make this a good choice for those just learning about their LaserJet or compatible printer; advanced users will find this package suits all of their font needs."

Benchmarks, LaserJet Journal
"MoreFonts is the overall winner of the seven font generators we tested..."

BENCHMARK TEST RESULTS

Rank	Product	Speed	Font Qlty.	Features	Total
1	MoreFonts	7	5	6	18
2	Font Solution Pack	2	6	7	15
3	Type Director	6	4	4	14
4	Glyphix	3	7	3	13
5	Fontware	5	3	2	10
6	Digi-Quilt	1	1	5	7
6	FontMaker	4	2	1	7

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Circle 87 on reader service card

REVIEW

Command Post 7.0

Windows Front End

ON THE SURFACE, WILSON WINDOWWARE'S $49.95 *COMMAND POST 7.0* SEEMS LIKE A GLORIFIED VERSION OF *WINDOWS 2.*XX'S MS-DOS EXECUTIVE—A PROGRAM MANY *WINDOWS* VETERANS WOULD JUST AS SOON FORGET. BUT DIG A LITTLE DEEPER, AND YOU'LL DISCOVER A FLEXIBLE, ALBEIT ARCANE, tool for creating custom pulldown menus with batch-file effects. This new *Command Post* also features a file viewer, a directory tree, and a screen blanker, and it can replace the Program Manager as *Windows'* shell.

What Program Manager does with program groups and icons, *Command Post* accomplishes with pulldown menus. And with its modest programming language, you can customize menus, create simple dialog boxes that prompt for user input, and tie a single menu option to multiple actions. For example, you can design a menu option that loads several *Windows* applications and resizes and places their windows where you want them—something that *Windows* still can't do.

However, modifying or creating menus may be a bit perplexing for novices, since you edit a text file with a simple programming language. If you aren't comfortable writing code in dBASE or BASIC but want more control over the *Windows 3.0* desktop, alternatives like hDC's *Windows Express* are a better choice.

Command Post's file management capabilities are only fair, and the program doesn't offer anything beyond the File Manager. In some ways, *Command Post's* version is inferior. For example, you can't copy or move files by dragging. You can tag files en masse, but there's no directory browse mode, so you must type in the target directory name. This latest version adds a new directory tree that simplifies moving among directories, but it's not well integrated with the file manipulation commands.

The separate Browser application displays the contents of any file—a feature that, surprisingly, has been absent from all versions of *Windows* thus far. You can even limit the display to lines that contain a particular text string. Lest you get too excited, Browser does not support specific formats, so displaying text and worksheet files will also display formatting codes. PCX and other graphics files appear simply as digital garbage.

Since it's a shareware program, you can pick up *Command Post 7.0* from your favorite BBS before shelling out any cash. Until you pay the registration fee, you're locked out of Browser, and the program periodically pops up a dialog box asking for $49.95—a sufficiently annoying ploy that will force you to either pay up or erase the program from your hard disk.

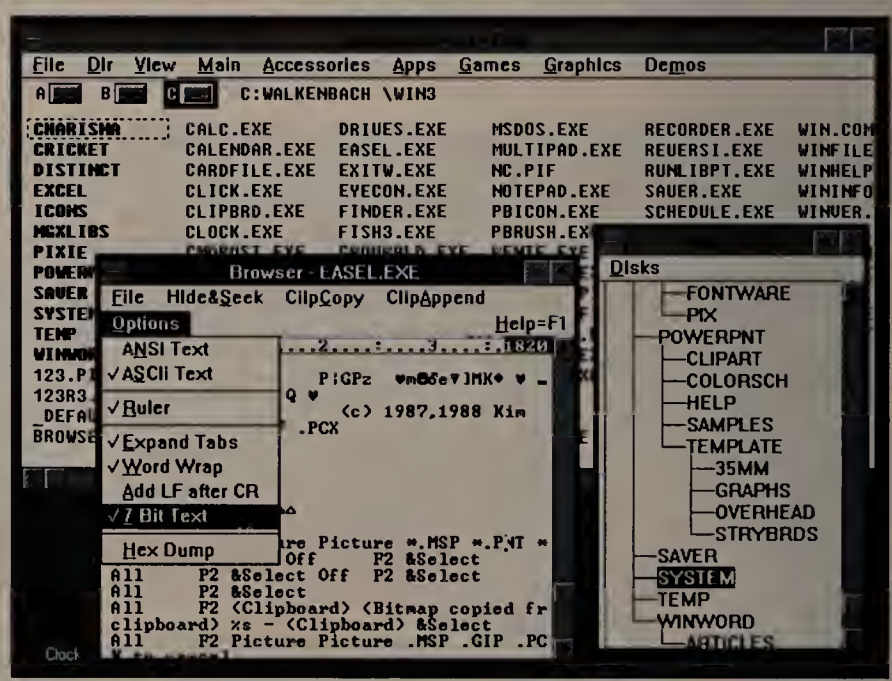
Windows 3.0's much improved interface minimizes much of *Command Post's* appeal. But if you like the idea of opening several applications with a single command—or find *Windows'* colorful icons a bit too cute for your taste—*Command Post* is a good alternative to the Program Manager. And it's the only *Windows* front end that you can try before you buy.

PROS: Can create custom pulldown menus; menu options can launch programs and move and size windows

CONS: Menu creation not for novices; crude file viewer cannot display graphics; minimal on-line help

WHERE TO BUY

Command Post 7.0
Wilsan WindawWare
2701 Califarnio Ave. SW #212
Seattle, WA 98116
800/762-8383, 206/935-7129 (fax)
LIST PRICE: $49.95
REQUIREMENTS: 50K, Windows 3.0, 250K hard disk space; mause recommended
TECHNICAL SUPPORT: 1 haur free suppart during first 90 days for registered users, toll number, M–F 9–9
OTHER SUPPORT: none
Reader service no. 612



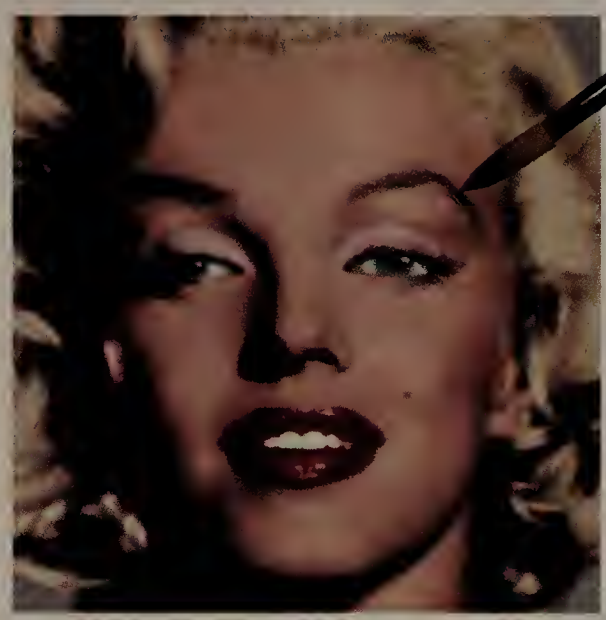
Command Post lets you create custom menus and dialog boxes. Because the Browser doesn't support native formats, you may see formatting codes.

GORDON STUDER

JOHN WALKENBACH

The Drudgery Of Image Processing Just Went Out The Window

Automatic Filters *remove spots, sharpen resolution and equalize scanned images.*



Zoom In *and* ***Zoom Out*** *at multiple levels; all tools usable at any level.*

Tint *images to alter color or shade from a palette of up to 256 colors or grays.*

Cut-And-Paste *scanned images on existing backgrounds or create your own textured and gradient backgrounds.*

With Publisher's Paintbrush®—ZSoft's new, top-of-the-line paint and image processing program for Windows™ 3.0. The program designed for professionals. Integrating ZSoft's best-selling paint tools, complete scanner control...plus the most powerful, sophisticated image processing available.

With multiple views of images in multiple windows, extensive on-line and context sensitive help, Publisher's Paintbrush takes full advantage of Windows. You can even edit images that have more colors than your hardware supports and still retain all of your original detail for true device independence.

Automatic retouching features let you blend, smudge, sharpen, brighten, equalize and adjust image contrast. Special effects let you tint, add patterns and gradient fills, create 3-D effects, give images a mosaic look, and more. Publisher's Paintbrush comes with all the standard drawing tools (lines, curves, geometrics). Plus multiple level zooms let you move from precise editing...to larger-than-screen size images while accessing all tools, retouching features, and special effects. With Publisher's Paintbrush, creativity knows no limits. For information about the image processing program for professionals, call us at (404) 428-0008.

ZSoft
CORPORATION

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REVIEW

Windows Workstation Release 3

Network Utility

RUNNING *WINDOWS* ON A NOVELL NETWORK HAS ALWAYS BEEN A CHALLENGE. *WINDOWS 3.0* SMOOTHS THE PATH A BIT, AND NOW, AUTOMATED DESIGN SYSTEMS' *WINDOWS WORKSTATION* TAKES UP WHERE MICROSOFT LEFT OFF—PROVIDING ACCESS TO NETWARE'S MULTIUSER PRINT QUEUES AND CUSTOM MENUS, AS WELL AS A POWERFUL SCRIPT LANGUAGE.

The most impressive part of *Windows Workstation* is Print Manager, which replaces *Windows'* own utility of the same name. With it, you can connect to a printer simply by selecting one from a scrolling list of descriptions like 'Letterhead LaserJet 2nd Floor', and switch between three active printers by clicking on their icons. Printer connections are automatically saved on exit and restored when you restart *Windows*. You also get special network tricks like custom banners and delayed printing of jobs at a set date and time (handy for those 500-page reports).

Workstation's menu utility will appeal to network administrators especially, because they can create custom menus that list applications and scripts that all users can run, regardless of each networked PC's graphics mode. In fact, a clever administrator could write scripts tailored to each PC, loading the appropriate INI files and custom *Workstation* menus.

Network administrators will also love *Workstation*'s script language, a powerful hybrid of batch files and network log-in scripts. For example, a single shared script run automatically every time a user started *Windows* could load different programs and menu files, depending on the groups a user belonged to. The Managers group script could start up *Excel*, connect to E-mail, and load a *Workstation* menu listing information services. Scripts can be triggered by any *Workstation* menu and can change DOS environment and *Windows* INI variables on the fly.

Finally, there are some useful goodies that both users and administrators will appreciate. Click the Secure Station padlock icon, and your PC's screen goes blank and the keyboard is locked until you enter your network password. The lock can go on after a set period of inactivity and can even flash a custom message ('Back at 1:00'). There's a slick date/time clock with an alarm that can merely beep or can launch a program or a script. Finally, there's a point-and-shoot *Windows* interface for tapping NetWare's messaging utility.

Workstation offers a lot to *Windows* offices, but ADS doesn't stop with the program. It offers free phone support for *Workstation* and for *Windows* networking in general and runs a BBS on the latter topic that's open to anyone. If you or your network administrator is trying to make peace between *Windows* and your LAN, give ADS a call—and check out *Workstation*.

Robert Lauriston is a contributing editor for PC World.

PROS: Multiuser printer and menu utilities, powerful script language, password-protected screen saver, Windows interface for NetWare messaging, alarm clock, file encryption

CONS: Menu utility doesn't use standard Windows menu bar or display program icons

WHERE TO BUY

Windows Workstation release 3
Automated Design Systems, Inc.
375 Northridge Rd. #270
Atlanta, GA 30350
800/366-2552, 404/394-2191 (fax)
LIST PRICE: $695 for ten users; five-user version free with Microsoft LAN Manager 2.0
REQUIREMENTS: Windows 3.0, Novell NetWare 2.1 or later version, LAN Manager 2.0
TECHNICAL SUPPORT: unlimited, toll-free number, M–F 8–5:30
OTHER SUPPORT: BBS, technical bulletins
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Windows Workstation's Print Manager lets you connect to a new printer by clicking on its icon. Clicking the matching icon on the desktop displays print jobs in the queue.

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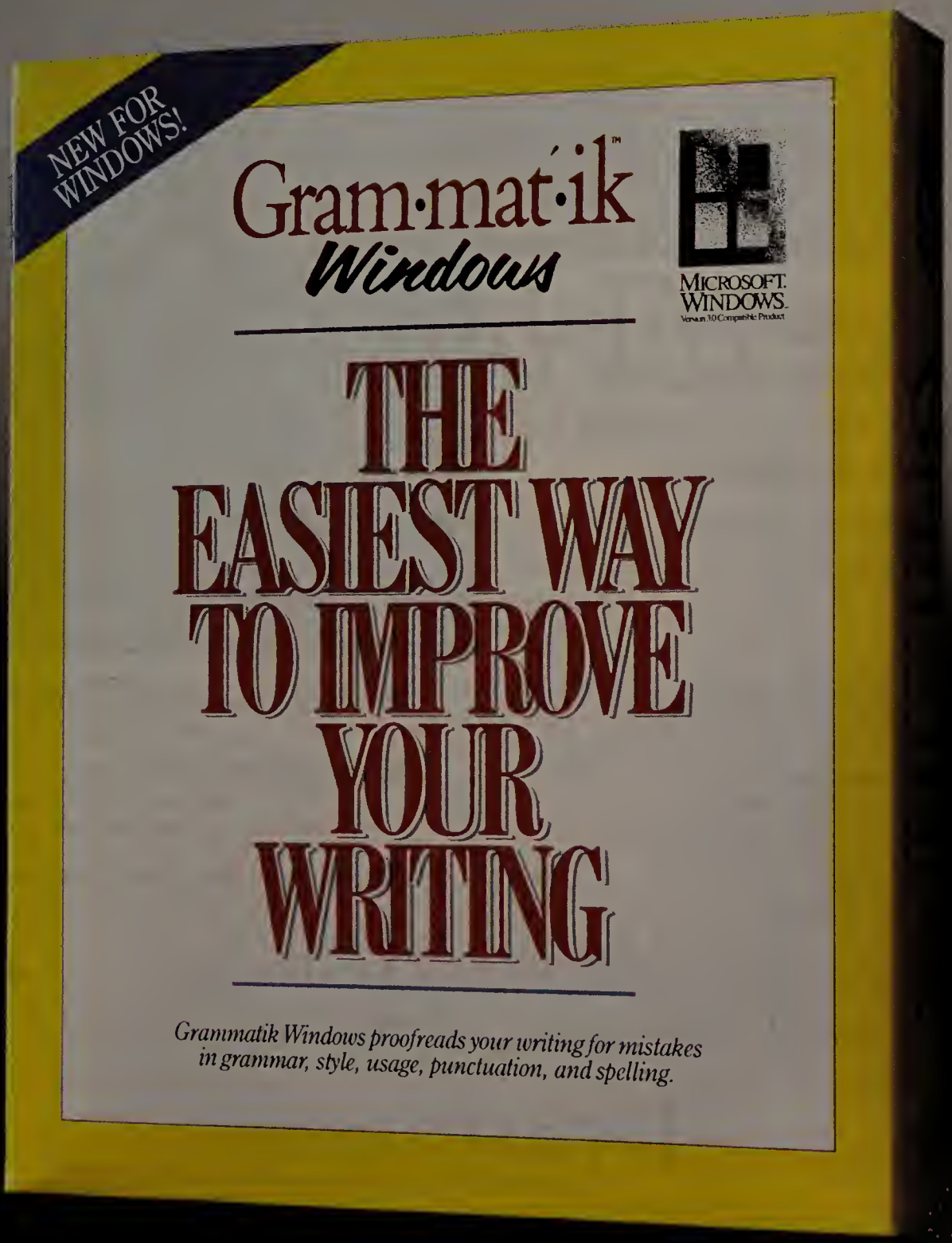

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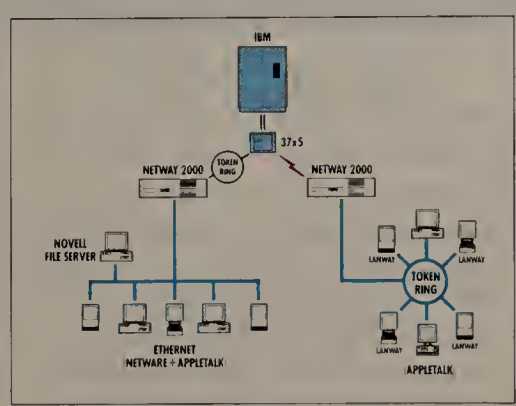

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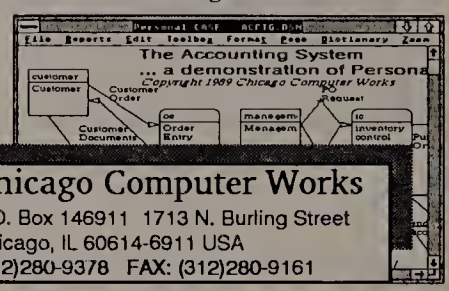

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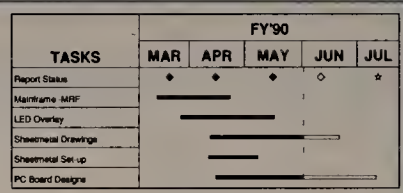

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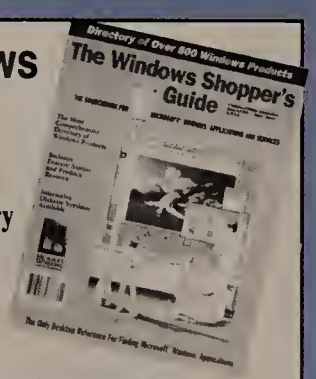

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CONTACT MANAGEMENT SOFTWARE

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Dear old Dad had it way too good. If he needed to make an appointment, he'd switch on the intercom and ask his secretary to check his calendar. If he wanted to view some background material during a phone call, he'd simply buzz and ask for it. And if he had to draft a letter, he'd lean back and jabber into the Dictaphone.

Today, few managers enjoy the luxury of a personal secretary, and support staff is spread thin. According to the U.S. Department of Labor, during the second half of the eighties, the number of managerial positions increased sharply, while the number of secretarial jobs declined.

Cast adrift, today's manager is handed a PC, a telephone, and a Rolodex and left to his or her own devices. To handle the onslaught of incoming data, managers are turning to contact management systems—souped-up name and address data bases that are usually combined with a scheduler. Many are hybrids of personal information managers (PIMs) and specialized programs designed for sales professionals.

A contact manager can help you keep track of appointments, business contacts, and text tidbits that relate to both. Its main purpose is to enhance the productivity of your phone conversations. For example, if you look at a profile screen of a business contact before you make a call, you'll be up-to-date on the state of the relationship: When was the last time you spoke? What were the agreements and goals that emerged from that discussion? And when did you promise to call again?

The following interviews show how business people have used contact managers to boost their productivity. To find the right program for you, refer to the Buyers' Guide that accompanies this story.

Field Sales: Keeping the Data Base Fresh

Although contact managers are moving rapidly into mainstream business, they find their biggest following in sales, especially telemarketing. When every phone call and meeting can translate into dollar signs, a contact manager can ensure that no lead goes begging.

Most salespeople are PC novices, so ease of learning is a crucial consideration. For William C. Brown Publishing, Iowa-based publisher of college textbooks, this was the key reason for choosing Contact Software International's *ACT*. "Most of our sales force did not have computer experience," says Brent Halls, Brown's information systems manager. "*ACT* helps the novice without limiting the expert."

One of the biggest hurdles in getting up and running is loading the data into the contact data base in the first place. According to Halls, *ACT*'s ability to import delimited ASCII files was helpful. "On our mainframe, we had a listing of all the professors in the various sales territories," says Halls. "We downloaded the data so that when our sales reps began using *ACT*, the data was already loaded." Another key feature is the ability to import and export data in record format; this enables field sales representatives to take the data base on the road in their laptops and then merge new leads into the data base when they return.

Scheduling for Travelers

When you're on the road all the time, scheduling takes precedence over phone management. Eric Albertson, an account representative for a systems vendor in Bellevue, Washington, uses *Instant Recall* from Chronologic, which offers strong scheduling features. "I cover five states, so I need a visual rep-

WHAT CONTACT MANAGERS CAN DO FOR YOU

- Help you prepare for important phone calls
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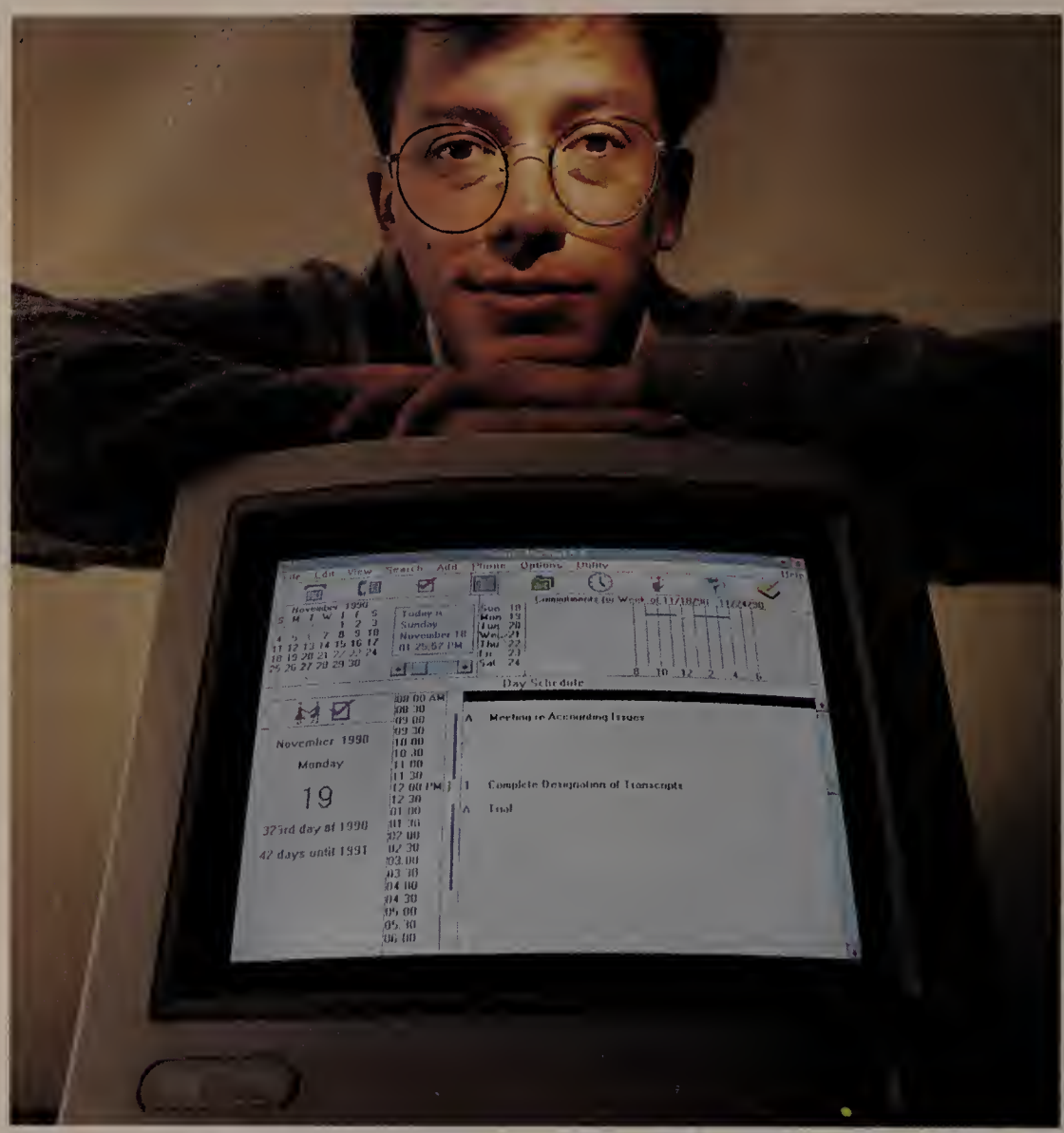
- Track sales leads
- Bill clients by time spent on the phone
- Dial phone numbers at the press of a key
- Keep and search electronic notes on each phone



It's the law—you don't win cases with sloppy organization. Los Angeles attorney Howard Jacobson depends on Polaris PackRat to keep and search text notes on each client and track telephone time for billing.

DAVID STRICK

resentation of how my time is moving," says Albertson. "I can quickly take a look at a time line to see where I have open time, which is very beneficial."

Instant Recall has made it possible for Albertson to get by without secretarial help. In fact, Albertson says that if he were given a choice, he might not go back to the old ways: "Sometimes it's more convenient to handle your schedule yourself."

Text Retrieval: No More Post-its!

For others, it's the text data base that makes a contact manager valuable. John Fabrega, fund-raiser for the Republican Party of Florida, uses Micro Logic's *Info Select* primarily for its Rolodex and scheduler, but he's also keen on its full-text wild-card searches. "In this job, there's always tons of bits of information," says Fabrega.

Before he discovered *Info Select*, Fabrega relied on Post-it notes, but with *Info Select*, users can retrieve anything, even if they can't remember where they stored it. "Things used to get lost in the clutter," says Fabrega. "Now I can find anything quickly."

The link between the scheduler and the text data base is crucial. "If we've got the president coming in, I'll open a stack [a text base of notes] for each event he's attending," says Fabrega. "Having the data in *Info Select* gets it to my fingertips faster."

Time and Billing: The Meter Is Ticking

For professionals such as lawyers and accountants who prepare bills based on time spent with clients, it makes sense to have a time tracker built into a contact manager. The Information Technology Audit Services western region branch of the accounting firm of Coopers & Lybrand recently chose the *Windows*-based *IBM Current*, primarily because of *Current*'s customization options and its sophisticated time and expense reporting.

The ability to create custom forms composed of user-defined fields was an important selling point. "We've set up report screens tailored to our firm's time-oriented billing methods," says Alan Gin, manager of Coopers & Lybrand's Microcomputer Advisory Services group. The result has been a major reduction in the time spent on generating reports. "*Current*'s time and expense reporting will save our group alone about 200 hours a month," estimates Gin.

Law offices also are concerned about time and billing. Howard Jacobson, an attorney at a major Los Angeles law firm, has found a solution in another *Windows* package: *Polaris PackRat*. *PackRat*'s phone log lets him keep running totals of the time spent talking to a given client. "Because we're always on the phone, it's important to have immediate availability of the phone log," says Jacobson.

Jacobson's search for the perfect contact manager wasn't easy. Many of the sales-oriented packages didn't make sense for a law office. Jacobson finally settled on *PackRat*, mainly because of its Boolean and full-text searching. "I don't need to follow up on a phone call in the same way that a salesperson does," says Jacobson. "What I need is to search for notes of a conversation by subject matter and case name in order to prepare legal documents."

Before he found *PackRat*, Jacobson used to take notes with pen and paper. "But you can't tell a PC to scan through your yellow pad to find a conversation you had with lawyer *X* a month ago," says Jacobson. "Often, I couldn't find what I was looking for, and I'd have to rely on memory. With *PackRat*, I don't have to remember."

WHAT'S SO FUNNY ABOUT CONTACT MANAGEMENT? ASK ATTILA THE HUN

Andy Bumatai with Brien Matson

I'm a stand-up comic. For the last five years, I've lugged around a Compaq Portable II and used it to organize my gigs. For me, speed is not an issue—the last thing I want is my financial program telling me I'm broke, only faster. But time is important, which is why I love my contact manager, *PrimeTime Personal*. How can you not love something that lets you tell people you'll be late three days from now?

I remember the day I bought my contact manager. Hmmm...which should I buy: the *most powerful* or the *ultimate*? It turned out that the *most powerful* was $50 more, so I settled for the *ultimate*.

When I reached home, my head swam with thoughts of how much more I could accomplish once I had organized every moment and detail of my life. All this thinking made me sleepy, and suddenly in my dream I became:

Attila: [*Phone rings*]. Hello?

Ivan: Yo, 'Til', it's Ivan here.

Attila: Ivan, you sound terrible!

Ivan: Just a little head cold—it's been freezing here ever since we used up all the heating oil on the attack of the hill people. But hey, forget about my problems—how does your afternoon look for boar hunting?

Attila: Lemme see...[*Sounds of a keyboard*] ...well, at 1 o'clock we're burning a village, and with pillaging and beheading, I'm tied up until 3.

Ivan: How about 5?

Attila: Naw, just can't swing it. My conflict-checking feature tells me we're publicly humiliating a king.

Ivan: Can't you split after he's shackled?

Attila: Naw, wouldn't look right—I've got an image to maintain here.

Ivan: OK, how about tomorrow morning at 8. We may even have time to sack a few duchies on the way home.

Attila: It's a done deal, babe. Love ya, love ya, gotta run.

I awoke in a cold sweat, and then and there I resolved never to use contact management for the purposes of evil.

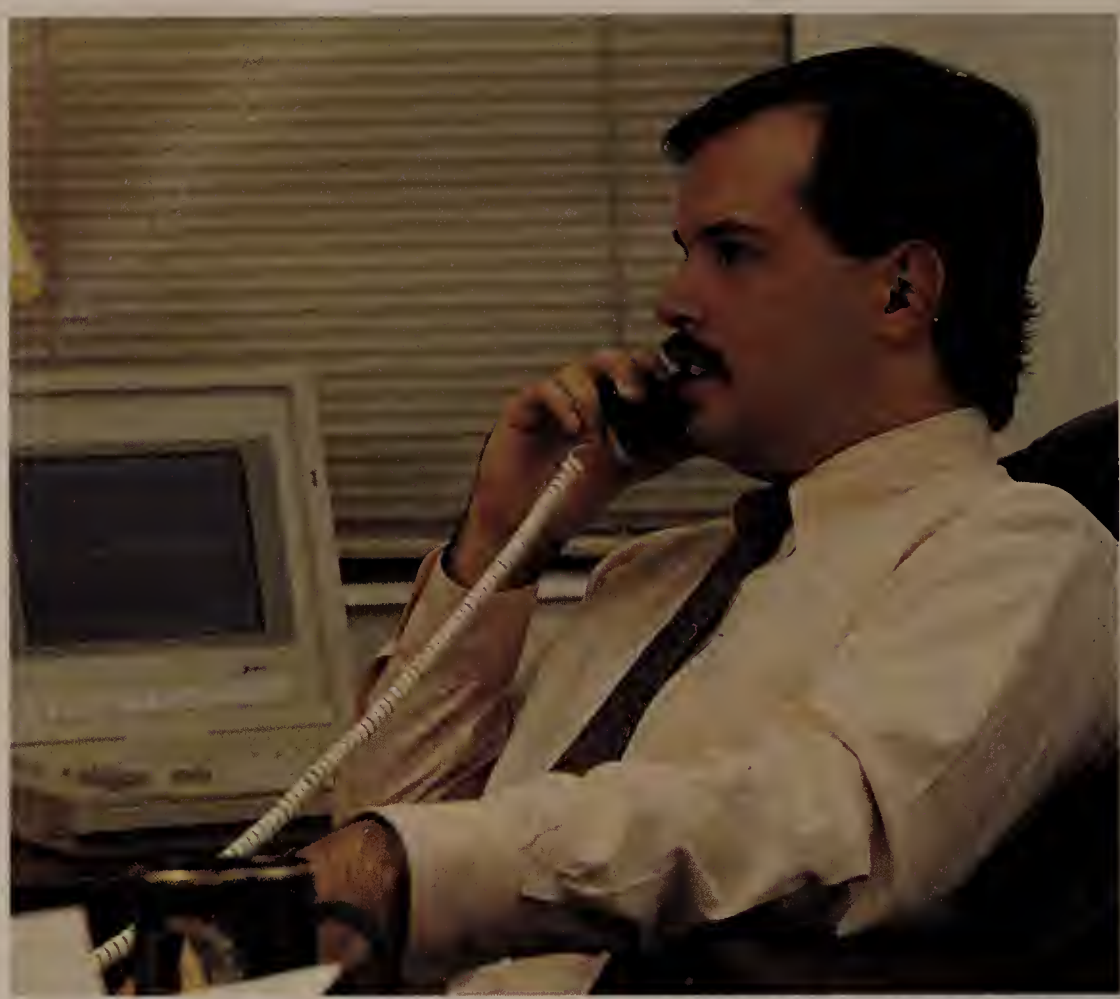
Feeling sanctimonious, I fired up *PrimeTime Personal* and started entering names and addresses, when I received a dull shock: *PrimeTime* wanted me to assign relationship codes to everyone I knew. Would I hang out with Gary if we didn't do business? How would Gretchen feel if she ever found out that her code didn't include the "also personal friend" classification? How does that password feature work again?

Rather than even begin to think about what codes others have assigned to *me*, I moved on to the to-do list. The key to task management is prioritizing. Never having been good at this, I foolishly hoped the program would do it for me. A short time later, I was proudly sitting in front of a three-week schedule of tasks—all designated A1.

Since then, I've become more comfortable deciding which is more important—that meeting with the IRS or helping my mom pick out a lamp. And I've found that changing relationship codes can be great therapy. (Author's note: At press time Gretchen had become "also personal friend.")

DAVID STRICK

Love ya, babe, but I gotta run! Comedian Andy Bumatai counts on PrimeTime Personal to keep up with his brutal tour schedule.



The president's arriving on an unexpected visit—and you've got to act fast. What to do? John Fabrega, fund-raiser for the Republican Party of Florida, uses Info Select to organize campaign trips and other whirlwind events.

RON BELL

The Networking Edge

Networking is the latest trend in contact management. It's especially popular with companies that have a large sales staff working with mutual clients. LAN versions range from vertical sales-tracking programs to the groupware versions of *WordPerfect Office* and *PackRat*, which both add LAN E-mail and group scheduling to the mix (see "The WordPerfect Office" in this issue).

Networking steered Training Alliance, a Salt Lake City telemarketing firm, toward a $1495 LAN version of *Action Plus*. According to President Kent Ekstrom, it's vital that the salespeople be able to share data with one another to locate the best prospects.

Because Training Alliance's data base is large and constantly being updated, a multiuser package was a must. "Networking is a big deal to us," says Ekstrom. "We work categories, not territories—for example, we'll call all the Taylors in the country, not just the Taylors in Los Angeles."

Tailored to Your Needs

Most contact managers try to do a bit of everything, but few do everything well. Using more than one package can solve this problem. But keeping multiple schedules and data bases can be confusing, and the real benefit of a contact manager is its integration between modules. Because meetings involve contacts, and phone calls generate scheduling, it makes sense to keep your schedule and contact data base together.

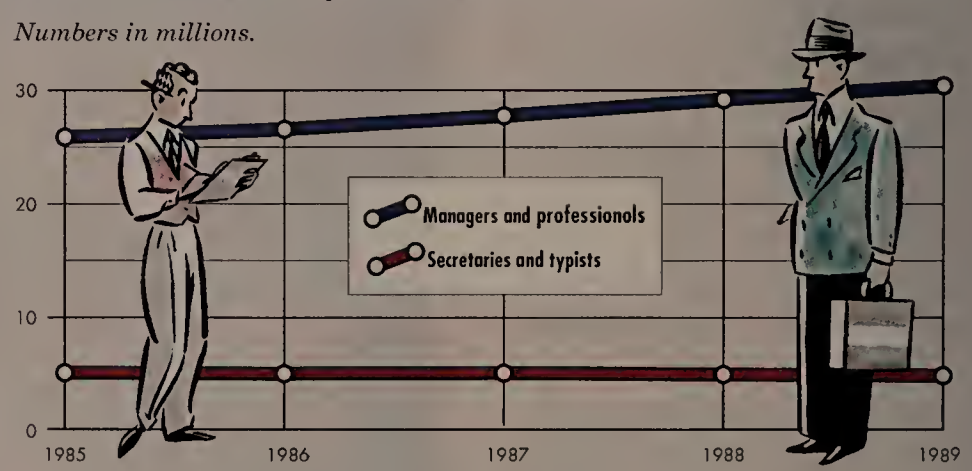
Another route is to find a program with user-defined fields, forms, and reports. But customizing a program is usually difficult. For this reason, many promising PIMs—such as *Agenda*—have gotten off to a slow start. In fact, some packages once advertised as PIMs are now billed as contact managers to avoid scaring off customers.

A third option is to wait for better contact managers to appear. The genre will continue to evolve as more programs try out new combinations of PIM and sales features—and refocus their packages from sales to management issues. In an office landscape with few secretaries, there's a growing need for programs that help you take care of the business of business.

Patrick Marshall is a writer for Congressional Quarterly's Editorial Research Reports. *Andy Bumatai uses a contact manager to plan his gigs with Tom Jones and the Beach Boys.*

MANAGERS, START YOUR PCS!

Numbers in millions.



While the number of managers grows steadily, the number of new secretaries has actually dropped slightly—all the more reason to consider a contact management program.

Source: U.S. Bureau of Labor Statistics.

CONTACT MANAGEMENT SOFTWARE

In an era when personal secretaries have pretty much gone the way of lunchtime martinis, most of us need help managing the details of professional life. Here are 30 options for keeping chaos at bay.

ROLLIN McGRAIL

Do you have trouble recalling the details of a week-old phone conversation? Can't remember when you were supposed to meet with what's-his-name from marketing? Wondering where you saved those brilliant ideas you had on the upcoming merger? Although you may be suffering short-term memory loss, it's more likely you're just another victim of information overload—the scourge of modern business.

It used to be that managers had secretaries to shield them from the world at large, but today most of us are on our own with a PC and a telephone. One of the best ways to cope is by using a contact management program.

A contact manager is any program that offers an auto-dialing data base of names, addresses, and phone numbers integrated with another major function, usually scheduling. The typical contact manager also provides text search, mail merge, and data base capabilities; some also sport time-, project-, and expense-tracking utilities.

The 30 packages covered here range from sales lead–tracking programs to personal information managers (PIMs)—productivity programs

PATRICK MARSHALL

devoted to scheduling and text management. Most PIMs are contact managers, but not all —for example, Lotus's *Agenda* and Persoft's *Ize* provide strong text base features, but they lack the auto-dialing Rolodexes that characterize the contact manager.

So toss out that Rolodex, desk calendar, and pile of cryptic Post-it notes. In this guide, we'll help you choose the right contact manager by isolating areas where you may need help getting organized and identifying the features to look for.

Phone Management If you are like most people, you're probably fed up with dialing (and misdialing) phone numbers, especially if your phone system requires long dialing strings. Fortunately, all the packages listed below provide an auto-dialer integrated with a directory of phone numbers: So long as you have a Hayes-compatible modem, you can dial numbers with the press of a key. Most packages also include a phone log that stamps each call with a time and date and lets you jot down notes. Particularly useful for salespeople, this feature enables you to review the history of a business relationship before you call.

If you're a lawyer, accountant, consultant, or any professional who bills by the minute, you'll need a time-tracking feature. This records the duration of each call and lets you assign calls to projects or clients for easy billing. If you don't plan to spend all your PC time using the contact manager, look for the ability to pop up the program as a RAM-resident TSR, so you can use it from within any application.

ROLLIN McGRAIL

The programs' data entry screens range from simple name-and-address templates to complex on-screen forms complete with fields that indicate the project name, sales lead status, and previously discussed subjects. If you want to track your contacts by information such as spouse's name and favorite hobby, look for a program that provides user-defined fields.

Data base functions range from flat-file phone books to lookups to full-fledged relational systems. The relational power you require depends on the number of contacts you'll be tracking and the complexity of their interrelationships. Most managers can get by with flat card-file systems, but networked sales staffs usually need a relational program. For example, you might have numerous contacts within a large company, and you may want to separate records into company and individual data bases and draw on relationships between the two for searches or reports.

Salespeople in particular will want to search, sort, and report on the contact data base to learn more about customer needs and better match customers to products. Most of the packages provide Boolean AND/OR/NOT searching, so you could ask for, say, "all the contacts who live in Illinois AND have purchased products, but NOT those who live in Chicago." Sales professionals will also appreciate the ability to generate tabular reports based on selected contacts and related fields. The ability to design forms is useful both to salespeople who produce reports and to billing professionals who want to generate customized invoices.

Most programs let you search all or selected text notes by text string. This searchable note field can be handy for any user who wants to quickly pull up relevant information recorded during earlier phone calls.

If you travel with a laptop and need to update your PC or server's central contact data base when you return to the office, make sure you can import and export formatted records. If you plan a lot of merging, look for the ability to check for duplicate records. These features also make it possible to share contacts in nonnetworked offices.

Scheduling If your work life has reached a level of complexity that cries out for contact management, you probably need a scheduler as well. Since most phone calls involve some form of scheduling, whether you're examining the status of a project, setting up a face-to-face meeting, or simply planning your next phone call, it makes sense to have a built-in calendar. Managers with fragmented workdays might want to base their buying decision on the strength of a contact manager's scheduling tools.

At a minimum, look for a daily log that lets you easily enter, reschedule, and print appointments. You'll also want a monthly calendar and a notepad for entering comments.

If your schedule is hectic, you'll need more help. Look for a graphic time line that shows several days at a glance so you can quickly see open blocks of time. Other desirable features include a conflict-checking feature that warns you if appointments overlap and one that can schedule recurring events, such as a meeting on the second Thursday of every month. Alarms and ticklers are also important if it's busyness as usual—alarms alert you on or before an appointment, and ticklers display the day's events when you boot up your PC.

Managers will find to-do lists and project trackers especially useful. To-do lists let you enter tasks to perform and target dates, and the best let you assign priorities. Project-tracking modules are more

complex, letting you view all tasks (and often task durations) by project.

Mail Merge and Productivity Most contact managers offer a text editor or a quick import/export routine to major word processors. Most provide mail merge, which lets you instantly pop a displayed address into a letter or merge a form letter with a list of names and addresses. These features are useful to anyone who regularly sends follow-up letters after making phone calls.

The more general-productivity utilities you have at your disposal, the less reason you have to switch to other applications. Most of the packages offer calculators, and some include expense tracking, with calculating fields that add up expense items and generate reports—valuable features for those who spend a lot of time on the road.

Networking Most of the programs offer LAN versions, letting networked users share and update the same data base. A multiuser version is vital if you have a large data base of contacts. Some packages even provide groupware features such as E-mail, group scheduling of meetings, and document tracking.

Here are some quick descriptions of 30 contact managers you can buy today.

ACT 2.0

One of the most popular contact managers on the market, *ACT* aims primarily at sales professionals, but its easy operation has also attracted general business users. *ACT* stands out from the pack with its full-featured word processor and strong mail merge. Contact Software Int'l, 1625 W. Crosby Rd. #132, Carrollton, TX 75006; 800/228-9228, 214/416-2311 (fax). List price: $395 (network version $1295 for four users).

Action Plus: The Personal Contact Information Manager

Until recently called *Action Plus Enhanced Sales*, this powerhouse is moving beyond its original sales audience toward the broader market of business managers. Emphasizing data base features, *Action Plus* even lets you put a name to a face—you can attach up to 50 photos or other PCX images to each contact profile. Action Plus Software, 11485 S. High Mountain Dr., Salt Lake City, UT 84092-5675; 801/572-3303, 801/572-3000 (fax). List price: $495 (network version $1495).

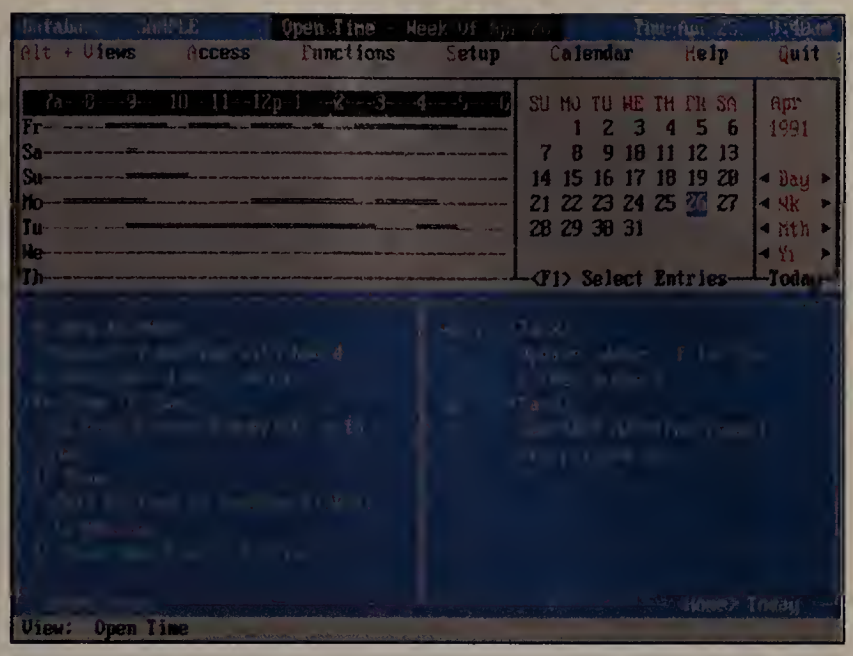
AllFinder 3.0a

AllFinder is aimed at laptop users who need to keep track of contacts while on the road. When importing and exporting records, the program checks for duplicates, so travelers can easily update the home PC's data base. *AllFinder* lacks a scheduler, but it

offers text searches and expense tracking. Infinity Technologies Inc., 120 Traders Blvd. #102, Mississauga, Ontario L4Z 2H7 Canada; 416/890-9797, 416/890-3814 (fax). List price: $149.

Arriba 1.01

Arriba is a low-cost, highly customizable PIM that specializes in keeping track of notes. You can modify fields, create your own custom data



When you're on the phone you need the information fast. Instant Recall's graphical time lines let you view a week at a glance for fast scheduling. Its text search feature lets you quickly call up notes on each contact.

forms, and make full-text and Boolean searches. Good Software Corp., 13601 Preston Rd. #500-W, Dallas, TX 75240; 800/635-6304. List price: $99.95.

Biz-Base Gold 2.0a

Biz-Base Gold is an industrial-strength contact manager designed for salespeople. Highly customizable, *Biz-Base* uses lookup tables to speed data entry and ensure accuracy. The latest version adds a macro capability to control tasks such as mail merge. Creagh Computer Systems, 674 Via de la Valle #204, Solana Beach, CA 92075; 800/833-8892, 619/259-7174 (fax). List price: $395 (network version $995 for four users, $500 for each additional four).

Business Contacts and Information Manager

BCIM is a low-cost package aimed at salespeople and owners of small businesses. It's a stripped-down version of *Eighty/20 Advanced*, and *BCIM* users can upgrade at reduced prices. Although it lacks some advanced features such as alarms and Boolean searches, its data base is fully customizable, offering 100 user-defined fields and basic forms tools. Disk-Count Software, 1751 W. County Rd. B #107, St. Paul, MN 55113; 612/633-0730, 612/633-8678 (fax). List price: $69.95.

Contact Professional 2.4

Targeted at professional salespeople, *Contact Professional* lets you customize your contact profile screens with up to 100 user-defined fields. Its robust data base skills include the abilities to create 16-page notes and to sort by ZIP code. Pyramid Solutions Inc., P.O. Box 395, Stoughton, MA 02072; 800/343-4677. List price: $195 (network version $495).

The DeskTop Set 3.0

A *PC World* Best Buy, *The DeskTop Set* is a *Windows*-based PIM designed for the typical manager. Like *IBM Current*, it excels at scheduling. Providing extensive integration between modules, *The DeskTop Set* even lets you dial from the scheduler or drag entries between the phone book and scheduler. (For more information, see the review in this issue's "Windows Special Re-

TOP CONTACT MANAGEMENT TOOLS

				PHONE MANAGEMENT								SCHEDULING	
Product	Single-user price	RAM required	Phone log	Memory-resident mode	Time tracking	Number of user-defined fields	Create forms	Record import/export	Import duplicate checking	Searchable note field	Boolean searches	Alarms	Ticklers
ACT 2.0	$395	640K	Y	Y	Y	29	N	Y	D[1]	Y	Y	Y	Y
ACTION PLUS	$495	512K	Y	N	Y	10	N	Y	Y	Y	D[3]	Y	N
ALLFINDER 3.0A	$195	512K	Y	Y	N	0	N	Y	Y	Y	Y	Y	N
ARRIBA 1.01	$99.95	412K	Y	Y	N	25	Y	Y	Y	Y	Y	N	N
BIZ-BASE GOLD 2.0A	$395	640K	Y	Y	Y	50	Y	Y	N	Y	Y	Y	Y
BUSINESS CONTACTS AND INFORMATION MANAGER	$69.95	512K	Y	N	N	100	Y	Y	N	Y	N	N	Y
CONTACT PROFESSIONAL 2.4	$195	640K	Y	Y	N	100	Y	Y	N	N	Y	N	N
THE DESKTOP SET 3.0	$149	640K	Y	Y	Y	0	N	Y	Y	Y	N	Y	Y
EIGHTY/20 ADVANCED 2.23	$395	460K	N	N	N	16	N	Y	N	Y	Y	N	N
EMIS I	$695[5]	512K	Y	N	Y	▼	N	Y	Y	Y	D[3]	N	N
GOLDMINE 1.03	$149	450K	Y	N	Y	▼	Y	Y	Y	Y	Y	Y	Y
IBM CURRENT 1.1	$395	640K	Y	Y[8]	Y	▼	Y	Y	Y	Y	Y	Y	Y
IN-CONTROL 3.0	$99	640K	Y	N	Y	▼	Y	Y	Y	Y	D[9]	N	Y
INFO SELECT 1.12	$99.95	256K	N	Y	N	▼	Y	Y	N	Y	Y	N	Y
INSTANT OFFICE 3.93C	$199.95	162K	N	N	N	255[1]	Y	Y	Y	N	Y	N	Y
INSTANT RECALL 1.2	$99.95	512K	N	Y	Y	0	N	Y	N	Y	Y	Y	Y
THE LEADS TRACKER 2.0	$199	640K	N	N	Y	0	Y	Y	Y	Y	N	N	N
THE MANAGER'S ORGANIZER	$249	320K	Y	Y	N	0	N	Y	N	N	N	N	Y
MAXIMIZER 2.0	$295	512K	Y	N	Y	▼	Y	Y	Y	Y	Y	N	N
PARADIGM VII 3.2	$1295	640K	Y	Y	Y	▼	Y	Y	Y	Y	Y	Y	Y
PERFORMER 2.01	$295	450K	Y	N	Y	31	N	Y	Y	Y	Y	Y	Y
POLARIS PACKRAT 3.0	$395	640K	Y	Y[8]	Y	10	N	Y	Y	Y	Y	Y	Y
PRIMETIME PERSONAL 2.0	$189.95	256K	N	Y	N	0	N	Y	Y	Y	N	Y	Y
SALEMAKER PLUS 3.0	$395	640K	Y	N	Y	29	N	Y	D[1]	Y	Y	N	Y
TIME & COMMITMENT MANAGEMENT SYSTEM 1.0	$176	384K	Y	N	Y	0	N	Y	N	Y	N	Y	Y
TRACKER 4.0	$395	32K	Y	Y	N	17	Y	Y	Y	Y	Y	Y	Y
WELL CONNECTED SOFTWARE 2.0	$149	250K	Y	Y	N	2	N	N	N	Y	N	N	Y
WHO WHAT WHEN 2.0	$295	512K	Y	N	Y	2	N	N	Y	Y	N	Y	Y
WORDPERFECT OFFICE 3.0	$149	640K	Y	Y	N	99	Y	Y	N	Y	N	Y	Y
YOUR WAY 1.1	$199	640K	Y	Y	Y	▼	Y	Y	Y	Y	D[9]	Y	Y

[1]Extra-cost option.
[2]No task prioritization.
[3]AND only; no OR or NOT searches.
[4]Can print monthly calendar but can't display it.
[5]For EMIS I. Higher-end EMIS II costs $1995
[6]No block moves.
[7]Can launch external word processor.
[8]As a Windows application, it can pop up over other Windows applications.

port.") Okna Corp., P.O. Box 522, Lyndhurst, NJ 07071; 201/460-0677, 201/507-8725 (fax). List price: $149.

Eighty/20 Advanced 2.23

Tailored to the networked telemarketing crowd, *Eighty/20 Advanced* is lacking in scheduling and PIM-like utilities but offers sales-oriented extras. Telemarketing managers use it to write scripts that prompt the sales staff to ask questions, then pop up comment fields for answers. Among its data base tricks: When you enter a ZIP code, the city and state appear automatically. Eighty/20 Software, 126 W. Rock St., P.O. Box 3128, Mankato, MN 56002; 800/635-8020, 507/345-1270 (fax). List price: $395 (network version $995).

EMIS I

EMIS I is a sales-tracking program also used for applications such as order entry, donor tracking, and fund-raising. It lacks a scheduler, but it excels at phone management. The more expensive *EMIS II* adds advanced reporting and analytical functions. EMIS Software, Inc., 901 N.E. Loop 410 #526, San Antonio, TX 78209-1308; 800/822-3647,

Y = yes
N = no
D = deficient

▼ = limited only by available disk space

						MAIL MERGE AND PRODUCTIVITY						NETWORKING				
Daily scheduler	Time lines	Monthly calendar	Conflict checking	Recurring events	To-do lists	Project tracking	Text editar	Spelling checker	Mail merge	Expense tracking	Calculator	LAN version	LAN E-mail	Graup scheduling	Dacument tracking	Reader service number
Y	Y	N	Y	N	D[2]	Y	Y	Y	Y	Y	Y	Y	N	N	N	690
Y	Y	D[4]	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	691
N	N	Y	N	N	Y	N	Y	N	Y	Y	Y	N	N	N	Y	692
Y	Y	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	N	693
Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	694
Y	N	Y	N	Y	Y	Y	Y	N	Y	N	N	N	N	N	N	695
Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	Y	N	696
Y	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	N	N	N	605
Y	N	Y	N	N	N	Y	Y	N	Y	N	N	Y	N	N	N	697
N	N	N	N	N	N	N	D[6,7]	N	Y	N	Y	Y	N	N	N	698
Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	699
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	700
Y	Y	Y	N	Y	Y	N	Y	N	Y	Y	Y	N	N	N	N	701
Y	N	Y	N	N	Y	Y	Y	N	Y	Y	D[10]	Y	Y	N	N	702
Y	N	N	Y	Y	Y	Y	D[1,7]	N	Y	N	Y	Y	N	Y	N	703
Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	704
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	705
Y	N	Y	N	Y	Y	N	Y	N	Y	Y	Y	N	N	N	N	625
Y	N	D[4]	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	N	706
Y	Y	Y	Y	Y	Y	Y	D[7]	N	Y	N	Y	Y	Y	Y	N	707
Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	Y	Y	708
Y	Y	Y	Y	Y	Y	Y	N	N	D[11]	Y	N	Y	Y	Y	Y	709
Y	Y	Y	Y	Y	Y	Y	D[7]	N	N	N	N	Y	N	Y	N	710
N	N	N	N	N	Y	Y	Y	N	Y	Y	N	Y	N	N	N	711
Y	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	712
Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	N	N	713
Y	N	Y	N	Y	Y	Y	Y	N	Y	N	Y	N	N	N	N	714
Y	Y	Y	Y	Y	Y	Y	D[6]	N	N	N	Y	Y	Y	Y	Y	715
N	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y	716
Y	N	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	717

[9]AND and OR only; no NOT searches.
[10]Addition only.
[11]No internal mail merge; merges only with Word for Windows or Ami Professional.

For more information about all products in this table, circle reader service no. 905.

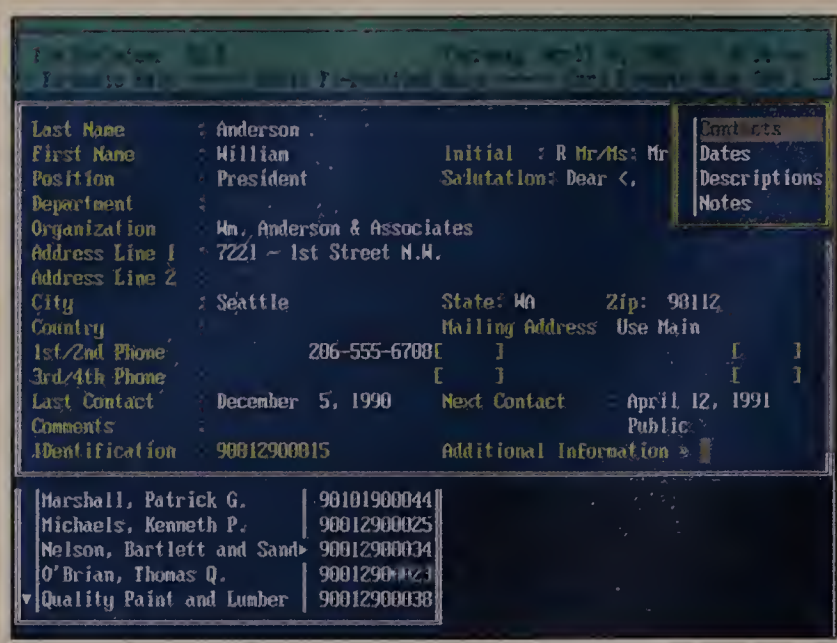
512/824-1145 (fax). List price: EMIS I $695 (network version $995 for three users); EMIS II $1995 (network version $2995 for three users).

GoldMine 1.03

Designed for networked telemarketers, *GoldMine* builds on a contact management core with features that automate sales office tasks such as lead referral and customer support. Offering a more powerful scheduler than most sales-oriented programs do, *GoldMine* still emphasizes data base functions such as unlimited user-defined fields and extensive search features. Elan Software Corp., 4917 Gerald Ave., Encino, CA 91436; 800/654-3526, 818/999-9903 (fax). List price: $295 (network version $695 for eight users, $1495 for unlimited users).

IBM Current 1.1

IBM's *Windows*-based *Current* is oriented toward managers with complex scheduling needs. Highly customizable, it lets you create your own fields, selecting from a half-dozen field types. You can link fields between records and jump quickly between them, and the project tracker even offers Gantt charts. IBM Desktop



With contact management packages such as Maximizer, you can keep track of where you've been and where you're going with each business relationship. Maximizer's data base tracks every detail.

Software, 472 Wheelers Farms Rd., Milford, CT 06460; 800/426-7699. List price: $395.

In-Control 3.0

Formerly called *Prospect*, *In-Control* is targeted at the individual salesperson. *In-Control*'s particular strength is data management—you get unlimited user-defined fields and duplicate-record checking, and you can generate custom reports such as invoices. Paul Sax, P.O. Box 850427, Richardson, TX 75085; 214/690-6017, 214/690-4782 (fax). List price: $99.

Info Select 1.12

Info Select is a RAM-resident personal information manager designed to search and sort random text files. It enables you to perform wild-card text searches, use Boolean operators, and conjure up customized data forms with unlimited user-definable fields. Micro Logic Corp., P.O. Box 70, Hackensack, NJ 07602; 800/342-5930, 201/342-0370 (fax). List price: $99.95 (network version $495).

Instant Office 3.93c

Instant Office is primarily a sales tool, but Dilworth also sells the program to managers. *Instant Office* lets you store up to a million records. You can jump to a word processor to perform mail merge, and there's built-in fax support. Dilworth Software, Inc., 24321 San Juan Rd., P.O. Box 1495, Carmel, CA 93921; 408/624-6500. List price: $199.95 (OS/2 version $395, network version $695).

Instant Recall 1.2

Instant Recall is a low-cost, RAM-resident PIM aimed at executives who need robust scheduling, task management, and project-tracking tools. *Instant Recall*'s ample scheduling features include conflict checking and the ability to schedule recurring events. Chronologic Corp., 5151 N. Oracle Rd. #210, Tucson, AZ 85704; 800/848-4970, 602/293-0709 (fax). List price: $99.95.

The Leads Tracker 2.0

The Leads Tracker's noncustomizable data base is designed with sales goals in mind—the various screens escort you through the process of turning leads into sales. The program even includes business graphics. Integrated Business Solutions, 5010 Mayfield Rd. #309, Lyndhurst, OH 44124; 216/691-1730, 216/691-1528 (fax). List price: $199 (network version $500).

The Manager's Organizer

From MECA, the people who brought you *Managing Your Money*, comes *The Manager's Organizer*. Based on a strong scheduler, the program includes a host of personnel tools designed for managers, including salary-planning worksheets, performance review forms, and employee calendars. It also stands out with financial and organizational tools such as cash-flow analysis, loan amortization, and contract-tracking features. MECA Software Inc., 327 Riverside Ave., Westport, CT 06880; 203/222-9150, 203/226-2437 (fax). List price: $249.95.

Maximizer 2.0

Maximizer's hallmark is its customizability. Unlike most contact managers, *Maximizer* eschews profile screens for lists of records that you can sort by any field category. The program is strong on phone management and lets you keep running totals of time spent on the phone with clients. Richmond Technologies & Software Inc., 6400 Roberts St. #420, Burnaby, BC V5G 4C9 Canada; 604/299-2121, 604/299-6743 (fax). List price: $295 (network version $695).

Paradigm VII 3.2

The heavyweight of sales packages, the high-priced *Paradigm VII* is focused on corporate marketing departments. It provides the full complement of telephone aids, and the strong data base includes text searches and forms design. Chesapeake Computing Inc., 8401 Corporate Dr. #560, Landover, MD 20785; 800/899-2255, 301/459-2410 (fax). List price: $1295 (network version $2495 for four users, $995 for each additional four).

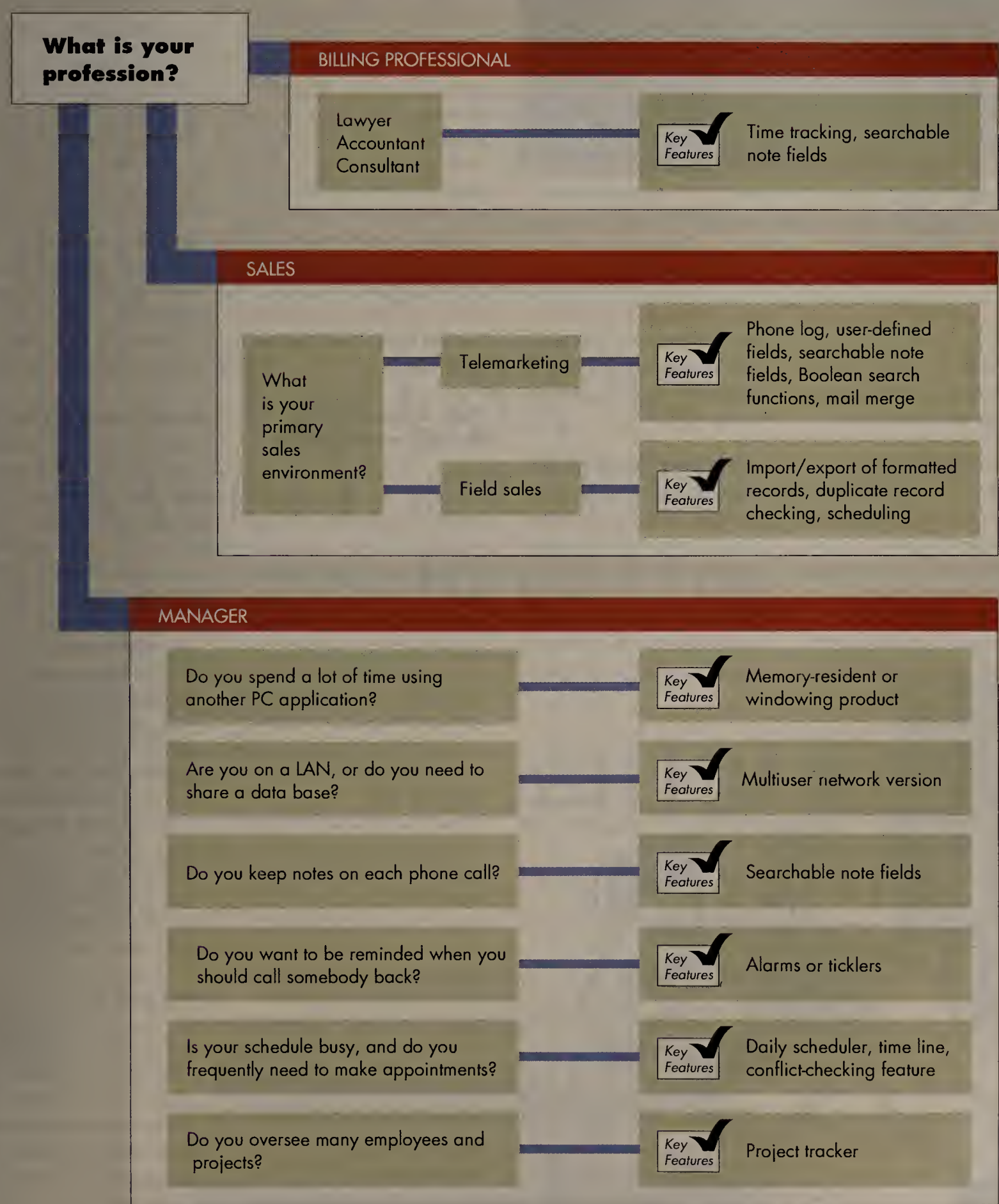
ROLLIN McGRAIL

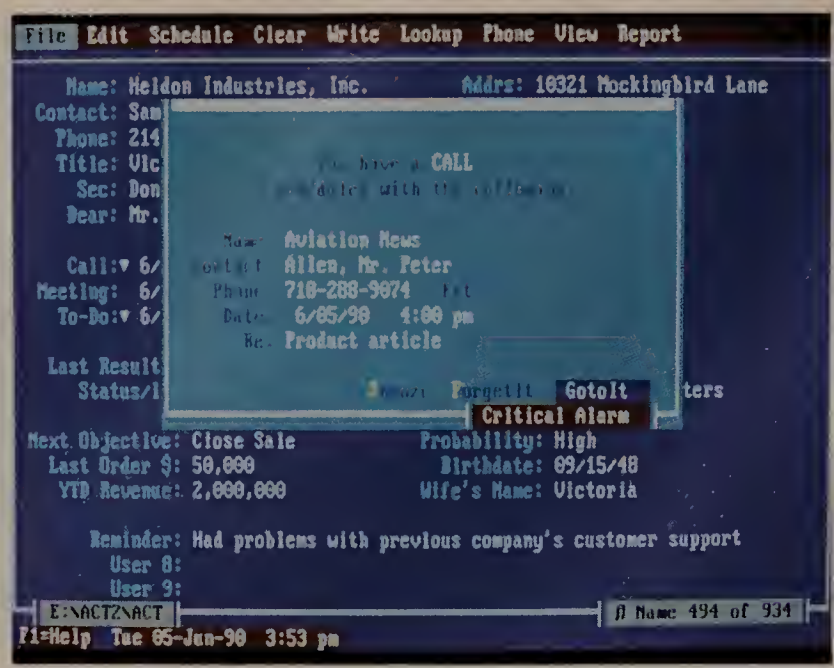
Performer 2.01

Performer targets networked sales staffs. The program excels at financial reporting, offering an expense tracker and numerous report formats. Performer Systems, 212 S. Palm Ave. #100, Alhambra, CA

What's Your Line?

Which contact manager is best for you depends on your profession and everyday activ ities. Once you decide which features you need, size up the packages in the Features Evaluation.





Originally designed for the sales market, ACT also enjoys popularity among other businesspeople. With ACT's profile screens in front of you, you keep every angle and opportunity open.

91801; 818/300-8570, 818/576-3979 (fax). List price: $295 (network version $695 for 5 users, $1295 for 25 users, and $1895 for unlimited users).

Polaris PackRat 3.0

PackRat is a feature-rich *Windows* PIM designed for the general business market. The program's time-tracking and text-search features have made it popular with attorneys. Polaris Software, 1820 S. Escondido Blvd. #102, Escondido, CA 92025; 800/338-5943, 619/743-9964 (fax). List price: $395 (network version $695 for three users, $150 for each additional user).

PrimeTime Personal 2.0

PrimeTime Personal is a time manager for the busy executive; its phone and data management skills are limited to an auto-dialing Rolodex. Scheduling features include a sophisticated to-do list and a project tracker. PrimeTime Software, P.O. Box 27967, Santa Ana, CA 92799-7967; 800/777-8860, 714/556-0954 (fax). List price: $189.95.

ROLLIN McGRAIL

SaleMaker Plus 3.0

SaleMaker Plus is designed for large networked telemarketing and direct-mail operations that run multiple projects. Its relational data base handles 100,000 records using a fast Btrieve branching search structure. There's no scheduler, but an automated transfer routine lets field sales personnel easily update the central data base. Software of the Future Inc., P.O. Box 531650, Grand Prairie, TX 75053; 800/766-7355, 214/262-7338 (fax). List price: $395 (network version $1495 for five users, $995 for each additional five).

Time & Commitment Management System 1.0

Designed for anyone who needs to keep track of a busy schedule, *TCMS* emphasizes calendar and phone management. It's weak on data base skills, but the strong scheduler includes daily, monthly, and six-week displays. Avtone Management Consulting, P.O. Box 104, Magalia, CA 95954; 800/456-8770. List price: $176.

Tracker 4.0

Sales professionals who are computer novices should investigate *Tracker*. It's easy to learn, and can run as a 32K TSR. *Tracker*'s scheduler is particularly feature rich for a sales program. Tracker Systems, 7486 La Jolla Blvd. #505, La Jolla, CA 92037; 800/776-7366, 619/455-7366 (fax). List price: $395 (network version $595).

Well Connected Software 2.0

Exploring the connections between business tasks, *Well Connected Software* lets you set up links between the calendar and word processor. Primarily a scheduler, *Well Connected Software* is chock-full of productivity aids, including an on-screen clock and a world time display. CaroWare Inc., P.O. Box 34150, Bethesda, MD 20827; 301/299-2200. List price: $129.

Who What When 2.0

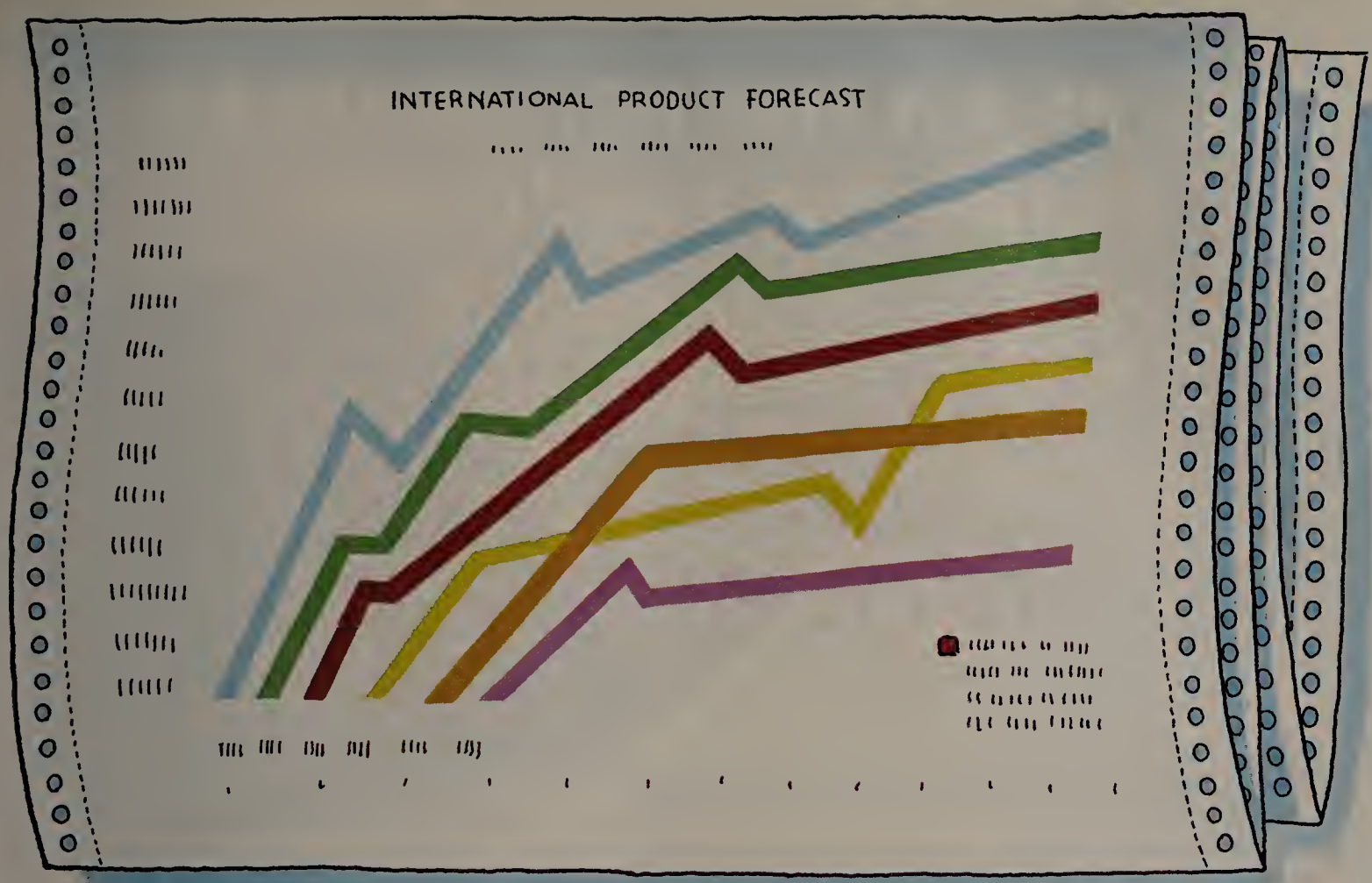
Who What When is essentially a robust calendar and to-do list sitting on top of a relational data manager. Aimed primarily at midlevel managers, this unique program is designed for individual and group scheduling and project tracking. Chronos Software, 555 De Haro St. #240, San Francisco, CA 94107; 800/777-7907, 415/626-5393 (fax). List price: $295 (network version $695).

WordPerfect Office 3.0

WordPerfect Office's mission is to provide *WordPerfect* users with advanced features such as time lines and the ability to schedule recurring events (see "The WordPerfect Office" in this issue). The program offers numerous productivity utilities such as a calculator and file manager, and you can design macros that integrate your WordPerfect applications. The LAN version is becoming a major player in the E-mail wars. WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057; 801/225-5000, 801/222-4477 (fax). List price: $149 (LAN version $495 for 5 users, $1495 for 20 users).

Your Way 1.1

Your Way is a *Windows*-based PIM with the usual mix of scheduling and phone management tools. It stands out with its word processor, which offers a spelling checker, a thesaurus, and mail merge. Prisma Software Corp., 2301 Clay St., Cedar Falls, IA 50613; 800/747-0319. List price: $199.



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Like all our new printers, it's equipped with our exclusive Color On Command™ feature which gives you the capability of installing dynamic color to make your spread sheets color efficient, graphs easier to understand, and your presentations simply brilliant.

Speaking of brilliant, it doesn't take a Phi Beta Kappa to operate the GSX-145. That's because the Command-Vue™ control panel prompts you with plain English directions on its LCD panel. The "Quick" menu gives instant access to the printer settings most often changed. It remembers your four favorite software programs and sets them up just the way you like them, every time you use them.

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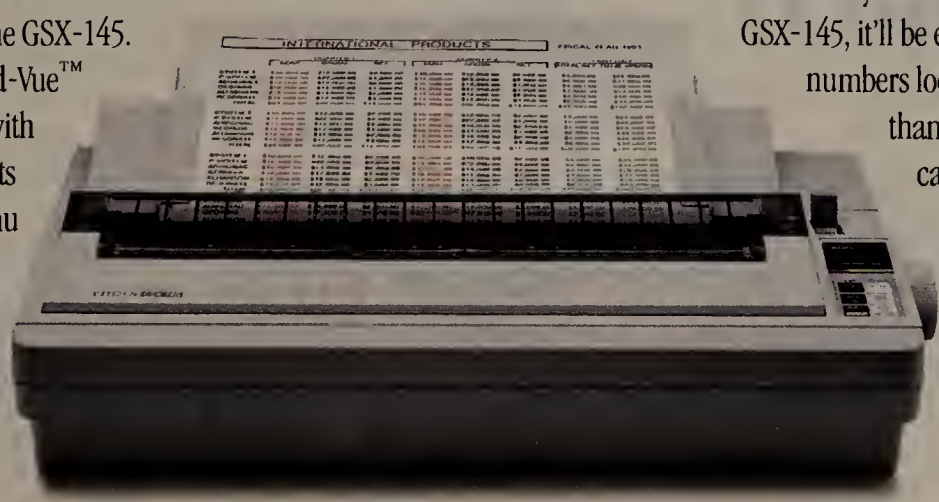
Once you've tried the new GSX-145, it'll be easy to see how it makes your numbers look good. This time, in more ways than one. For the dealer near you, just call 1-800-556-1234, extension 34, (in California 1-800-441-2345, extension 34).



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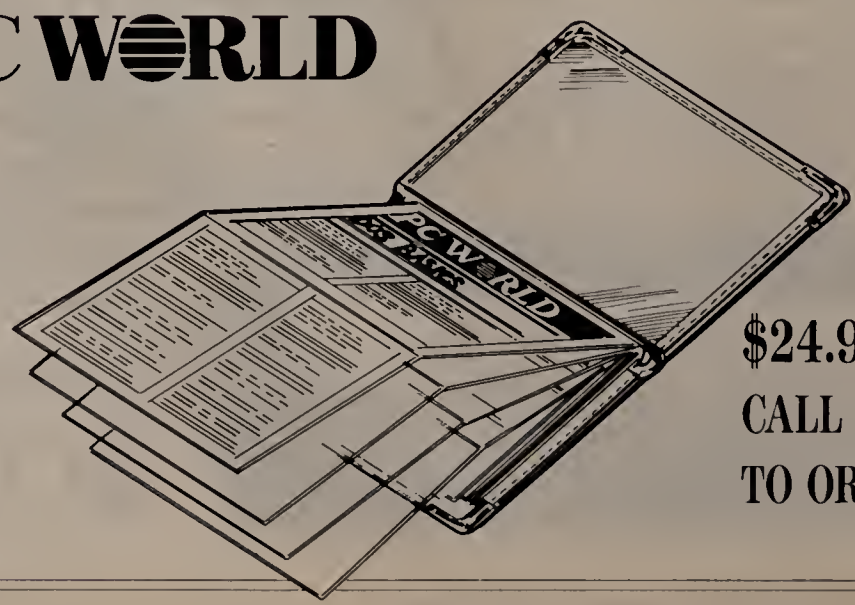
PC WORLD



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The WordPerfect Office

IF YOU USE WORDPERFECT PRODUCTS, WORDPERFECT OFFICE CAN PROVIDE A SIMPLE ANSWER TO COMMUNICATIONS AND FILE-SHARING NEEDS.

WordPerfect Office is one of Los Angeles attorney Ivan Halperin's most valuable tools for organizing his hectic work life and managing work flow throughout the law office.

Ivan Halperin, a senior partner with the Los Angeles law firm of Mallery, Stern & Halperin, believes in getting a jump on the day. He arrives at the office by 7 a.m.—long before calls and employees start competing for his time—and begins a routine that helps bring order to a hectic and stressful workday.

Halperin's first order of business is a review of his appointment calendar and to-do list "to get a quick handle on what's in store and organize my day," he explains. Then it's on to his E-mail program, where he responds to messages, sends out new assignments, and requests status reports on current projects.

At about 8:30 he meets with the firm's two other senior partners, and together they review the firm-wide calendar for the next ten days, noting key court and document-filing deadlines and reallocating staff to make sure projects can be completed on time.

By 9 a.m. Halperin's work life is organized and he's ready to

AMY ETRA

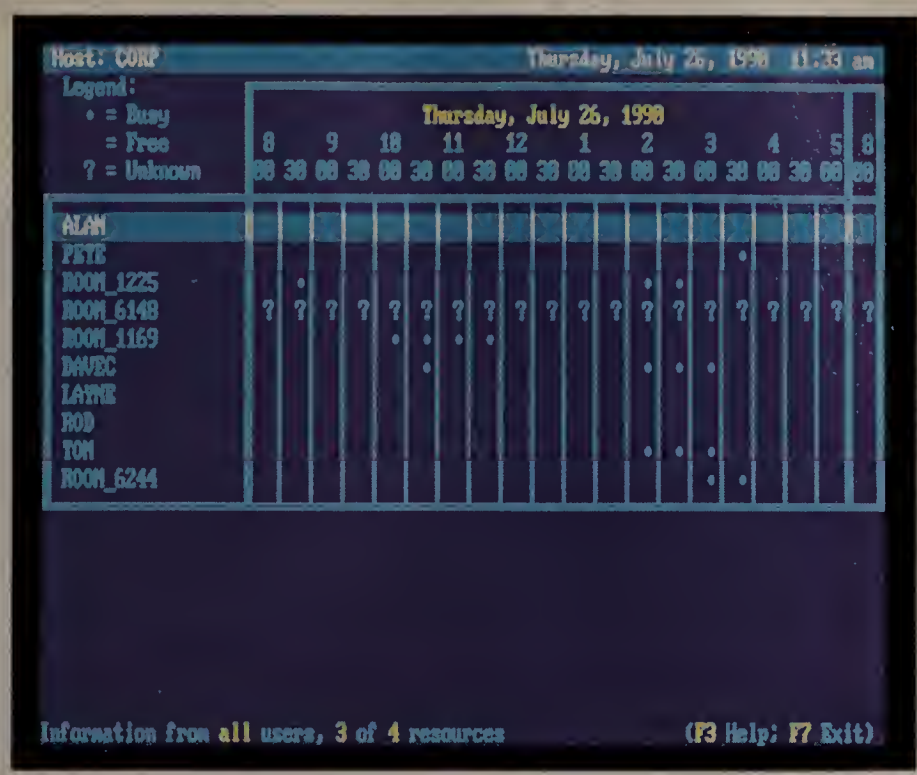
ROBERTA FURGER

begin tackling other projects.

Halperin's routine isn't very different from that of thousands of professionals who use a PC to organize their work. What is different, though, is that he coordinates all these tasks using one product: *WordPerfect Office.*

"*Office* offers the kind of integration you get with high-end automation systems: transparent file transfer from one task to another, and lots of little utilities," says Jeffrey Tarter, publisher of the newsletter *Soft-letter.*

Few other PC applications can make that claim.



Office's Scheduler can be used to coordinate interdepartment meetings and manage the use of companywide facilities.

EVERYTHING BUT THE KITCHEN SINK

Office includes an unusual assortment of features that makes it unique even among the do-everything packages on the market, such as *SideKick Plus* and *PC Tools.* For the individual PC user, it includes a shell to manage applications and exchange data between programs, a sophisticated macro editor, a file manager, a to-do list, a calendar, a calculator, and an electronic Rolodex.

The network version of *Office* adds group scheduling and electronic mail for managing the flow of information and coordinating group activities. With version 3.0, introduced last June, *Office*'s networking capabilities have been significantly enhanced. Most notably, *Office* now supports wide area networks. Multiple networks can now be connected through phone lines, network connections, or gateways that link *Office* users to other E-mail systems such as PROFS, telex, CompuServe, and MCI.

SAY GOODBYE TO TELEPHONE TAG

Office really shines when used by everyone in a work group. Let's say, for example, that you need to plan a meeting of the sales and marketing staff—half of whom are never in the office. Rather than calling everyone individually, you can simply let Scheduler go to work, checking individual appointment calendars and reporting back the first date and time everyone has free.

This kind of feature is a lifesaver at St. Luke's Hospital in Fargo, North Dakota, where the staff is spread out among five sites. In the past, trying to coordinate interdepartment meetings often would deteriorate into an endless game of telephone tag, says Teresa Frisch, client support technician for St. Luke's. "Now *Office* figures out when everyone is free, and all individuals have to do is respond." Once the installation at St. Luke's is complete, more than 350 employees throughout the hospital will be using *WordPerfect Office* both to communicate with fellow staff members and to plan group activities.

There's only one potential flaw: Scheduler is useless if everyone doesn't keep their personal calendars updated, and, as with any groupware application, getting people to change their habits is a challenge. Ivan Halperin says his office ran into that problem shortly after *Office* was installed. The firm still hasn't achieved 100 percent compliance, but as users begin to see the benefits of Scheduler they're more willing to keep their personal calendars updated. "Even some of our most recalcitrant people are getting better about using the system," says Halperin.

A CAPTIVE AUDIENCE

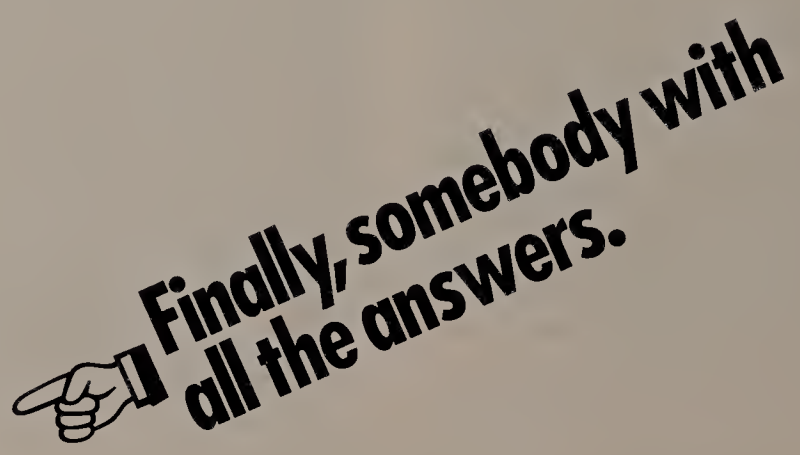
For *WordPerfect* users, the attraction to *Office* is clear: Sharing data and switching between *WordPerfect, DrawPerfect,* and *PlanPerfect*—or even *1-2-3*—is effortless. "You also don't have to rethink keystrokes, so it's a much shorter learning curve," says Nancy Goldstein, systems educational coordinator with Front-End Systems, an Atlanta company that specializes in networking.

But *Office* has made few inroads beyond *WordPerfect* fans. "It's hard to imagine [a non-*WordPerfect*] user using *Office,*" says *Soft-letter*'s Tarter. "It would seem strange to have someone standardize on *Microsoft Word* but rely on *Office* for their extended environment."

WordPerfect's own solution to this problem is the company's upcoming *Windows* version of *Office.* Many of us are just beginning to discover that *Windows 3.0* helps integrate favorite applications, with many of the same communications and work-organizing benefits that *Office* provides. Future *Windows* versions of WordPerfect products can unite the small but loyal band of *Office* devotees with a growing army of *Windows* users. That way, we get freedom of choice and a chance to enjoy the integration that *Office* provides.

Roberta Furger is an associate editor for PC World.

Who put the bop in the bop-sh-bop-sh-bop?
Why is the sky blue?
When will the bull market be back?
How much does Isaac Asimov weigh?
Why won't my Macintosh talk to my laser printer?
How do you fold fitted sheets?
How's the weather up there?
Where can I find the best steak in Chicago?
How much is that doggie in the window?
How is OS/2 going to affect me?
Which hard drive is best for me?
Will you marry me?



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ML2611	12 inch	White	640x480 (VGA)	
ML4571	14 inch	White	640x480 (VGA)	
ML4646	14 inch	Color	640x200 (CGA)	
VGA GraphicsMaster (CJ4681)	14 inch	Color	640x480 (VGA)	
SyncMaster (CT4581)	14 inch	Color	800x600 (Super-VGA)	Multi Scan
SyncMaster2 (CVB4581)	14 inch	Color	1024x768 (Enhanced-VGA)	Interlaced
SyncMaster3 (CVB4587)	14 inch	Color	1024x768 (Enhanced-VGA)	Interlaced
SyncMaster4 (CSA7571)	17 inch	Color	1024x768 (Enhanced-VGA)	Non-interlaced, Flat Screen, Multi Scan
PageMaster (MP5671A)	15 inch	White	1006x1048	Full Page/DTP
PageMaster2 (MU9511)	20 inch	White	Super-high 1280x1024	Dual Page/DTP
DesignMaster (CC9511)	20 inch	Color	Super-high 1280x1024	CAD/CAM

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Technology that works for all of us.

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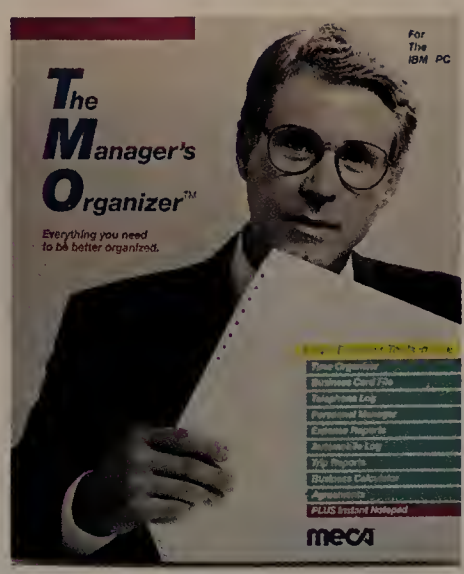
"Now I'm organized. And the process was painless."

"My New Year's resolution for the past three years running has been to better organize my 12-hour day. Somehow, I've never found the time or the right system to help me follow through. But my boss finally forced my hand. He asked me, along with three other department heads, to give The Manager's Organizer™ a try. It worked and the process was painless."

Richard Thomas, Sales Manager



The Manager's Organizer™

The Manager's Organizer gives you all the tools you need to organize tasks, time and people in one place. It manages the sometimes overwhelming number of obligations you currently handle manually or just never seem to handle at all. Importantly, it handles them better.

The Manager's Organizer is unique because it was developed with input from over 10,000 managers from a wide variety of disciplines. We asked for their organizational "wish list"and here's what they told us:

"To be really useful, this program needs to be as easy to use as pencil and paper. It has to include all the tools I need in one place. It must be available instantly without interrupting my work flow, and it has to have just the right combination of structure and flexibility. Most importantly, make it simple to use and get rid of the computer jargon."

We created a program which centralizes the huge mass of information you're expected to keep organized, accurate and current—so everything you might be called on to produce at a moment's notice is accessible with a keypress or two.

Then we integrated the most obvious program tools so you never have to enter the same information more than once. For instance, the Time Organizer "talks to" the Business Card File and Employee Records to remind you of key dates—personnel reviews, key project benchmarks, birthdays and anything else you can think of—automatically.

Once we satisfied ourselves, we gave **The Manager's Organizer** back to our 10,000 managers for a real-life, in-depth test. The product you'll use today reflects their extensive feedback and stamp of approval. We hope you'll place the same confidence in it that they do.

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Requires: 512K IBM® PC or compatibles, 2 disk drives. Hard Disk recommended. DOS 2.0 or later. Contains both 5.25" and 3.5" versions. Not copy-protected.

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Windows Walk-Through

Take this quick stroll through Windows, and learn the basics at a glance.

Robert Luhn

INSIDE HOW TO

199 **Word Processing**
Words Into Print
A step-by-step guide to automatic footnoting with *WordPerfect.*

205 **Spreadsheets**
Spreadsheets (A..Z)
The basics of graphing spreadsheet results with *1-2-3* version 2.*x.*

209 **Data Management**
Data Basics
Make data base reports readable with titles and column headings.

213 **Publishing & Graphics**
The Art of Persuasion
Tips for choosing the best typefaces for business documents.

217 **Communications**
The Information Edge
How to get the most out of GEnie's off-hour offerings.

221 **User Group Tips**
- Stash *Ventura* overflow
- Jam-free laser postcards
- Safeguard *Paradox* tables

Windowing Environments

Windows 3.0 may be the most intuitive operating environment ever devised, but it's not always easy to use. *Windows* offers a plenitude of tools, controls, and options, and remembering what they do (much less what they're called) is no simple task.

So here for your delectation is "Windows Walk-Through," a kind of super Instant Reference Card that introduces basic *Windows* terminology and operations. You'll see how to manipulate windows, open menus, run programs, navigate through all the panes, and perform other tasks. Combine this guide with our December 1990 Instant Reference Card on *Windows,* and you can leave the manual on the shelf.

A note on general operations: *Windows* and its applications adhere to a "select, then do" design. You select an item first, either by pointing with the mouse and clicking the left mouse button or by using keyboard commands, then perform an action. For example, to size a window, you grab its border, hold down the left mouse button, and then drag. To format text, you highlight the text, then pick a function from a menu.

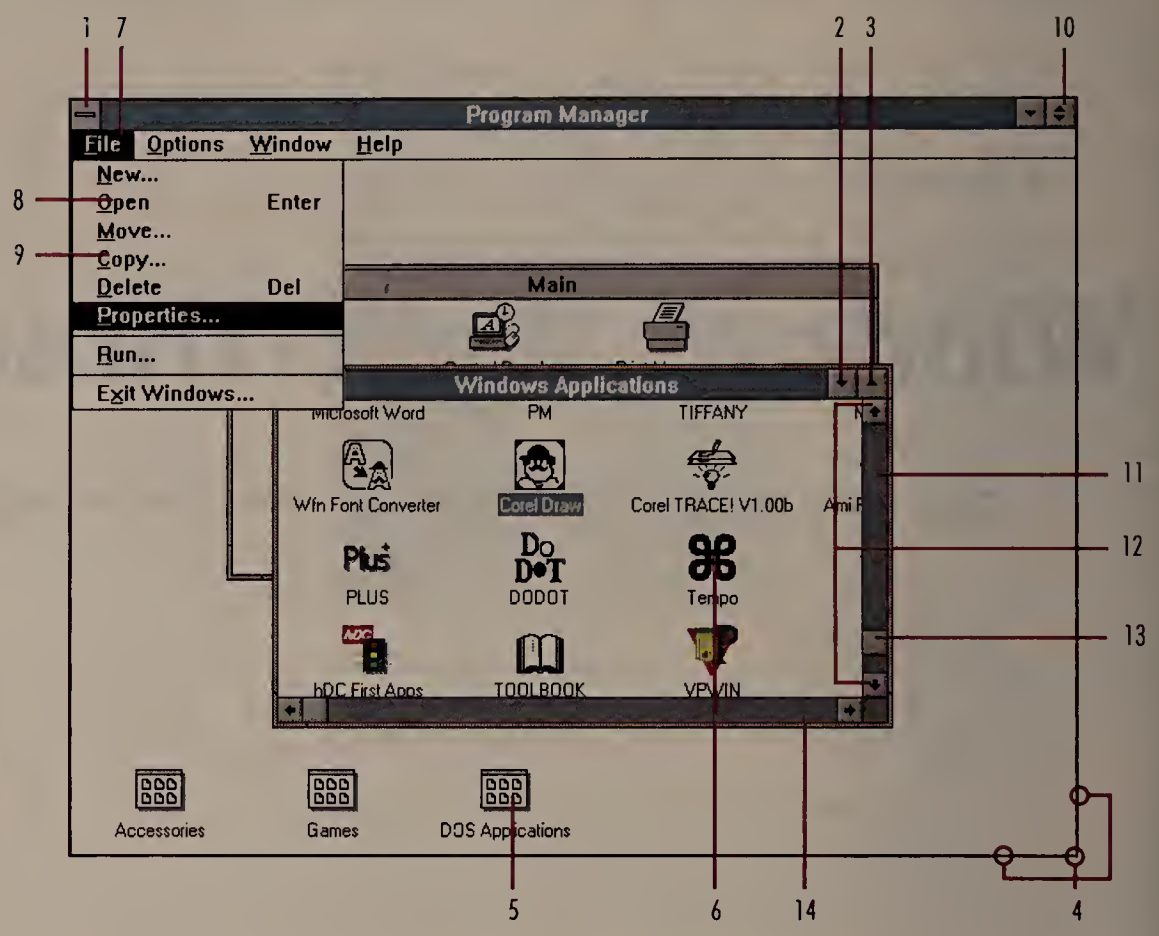
Keep in mind that although most *Windows* applications conform to these conventions, there are exceptions. An application's window can always be sized and moved, for example, but the dialog boxes and secondary windows a program generates may be immutable. When in doubt, experiment.

(continues)

Robert Luhn is a contributing editor for PC World.

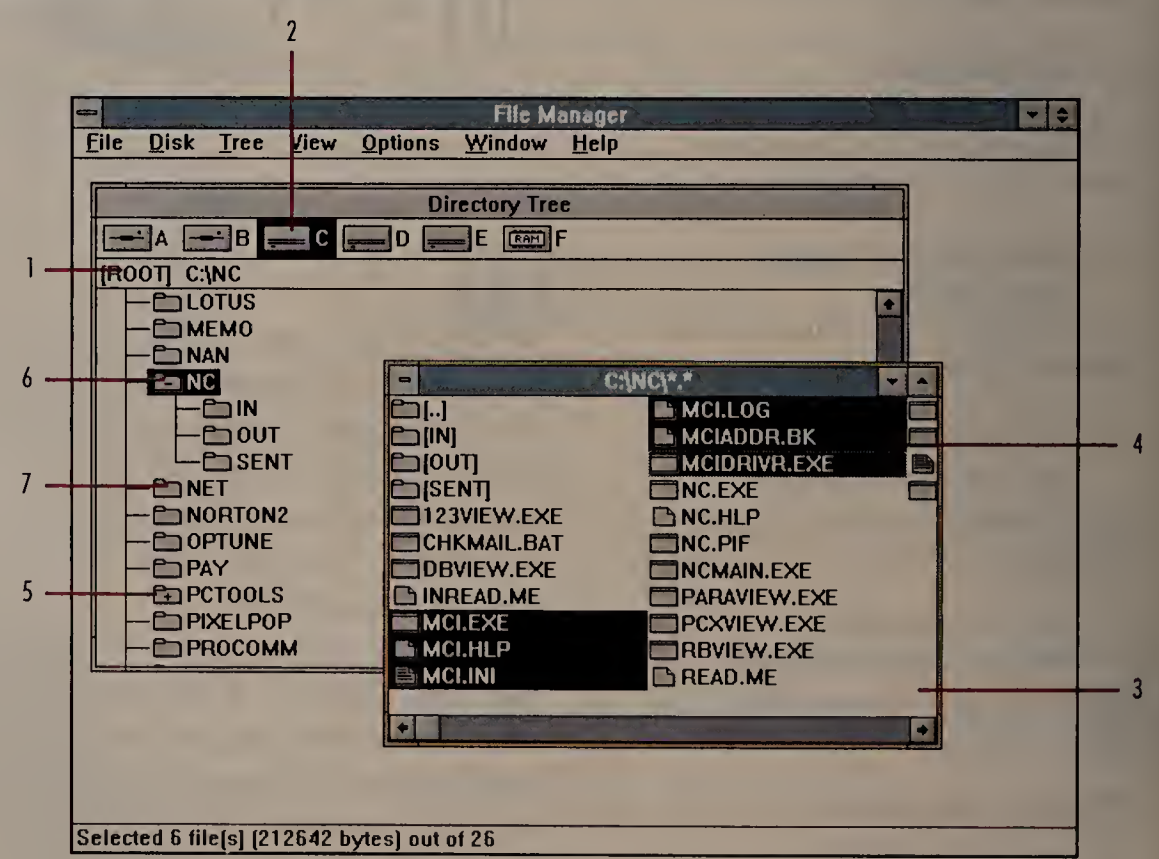
The Program Manager: Your First View of Windows

1. CONTROL MENU BOX
   Click to open control menu; double-click to close window.
2. MINIMIZE BUTTON
   Click to shrink window to icon.
3. MAXIMIZE BUTTON
   Click to expand window to full size.
4. WINDOW BORDERS AND CORNERS
   Drag at any point to resize window.
5. GROUP ICON
   Double-click to open window containing application icons.
6. PROGRAM ICON
   Double-click to run a utility or application.
7. PULLDOWN MENU
   Highlight options and click mouse, or type the underlined letter. Keyboard-equivalent commands are listed to the right of options.
8. MENU OPTION
   Click to invoke.
9. MEUN OPTION WITH ELLIPSIS
   Click to display dialog box or submenu.
10. RESTORE BUTTON
    Click to restore window to previous size.
11. VERTICAL SCROLL BAR
    Use to move window contents up and down.
12. SCROLL ARROWS
    Click to view one new line of information.
13. SCROLL BOX
    Drag up and down to scroll; box shows relative position of view in window.
14. HORIZONTAL SCROLL BAR
    Use to move window contents left and right.

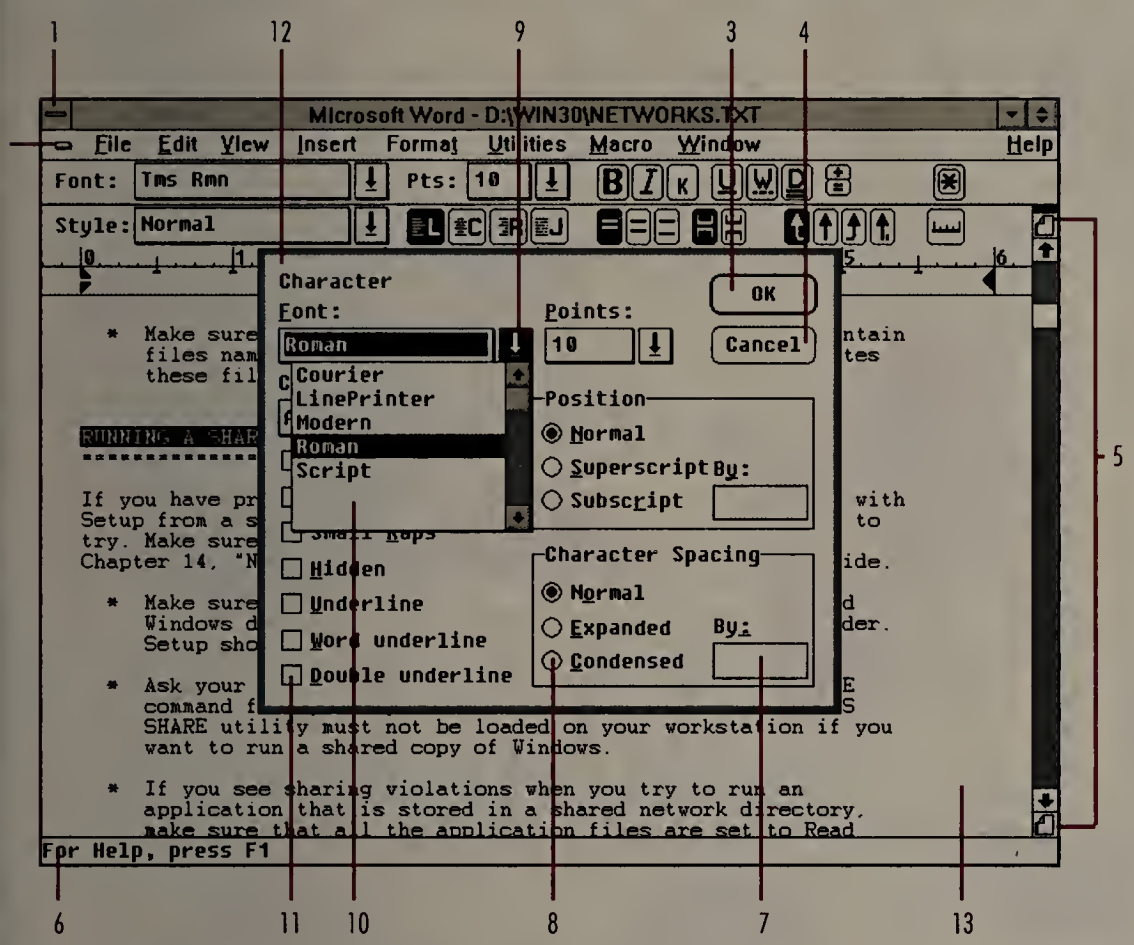


Managing Files: The File Manager and Directory Windows

1. VOLUME LABEL
   Notes selected drive and directory.
2. DRIVE ICON
   Click to display directory tree for that drive.
3. DIRECTORY WINDOW
   Lists files in directory.
4. SELECTED FILES
   You can select one, some, or all files in a directory window and perform a task, such as copying. Note: File icons are shaped according to function.
5. EXPANDABLE DIRECTORY
   Click directly on directory icon with a '+' to reveal child directories underneath.
6. COLLAPSIBLE DIRECTORY
   Click directly on directory icon with a '-' to hide child directories.
7. DIRECTORY ICON
   Double-click to display files in a directory window.

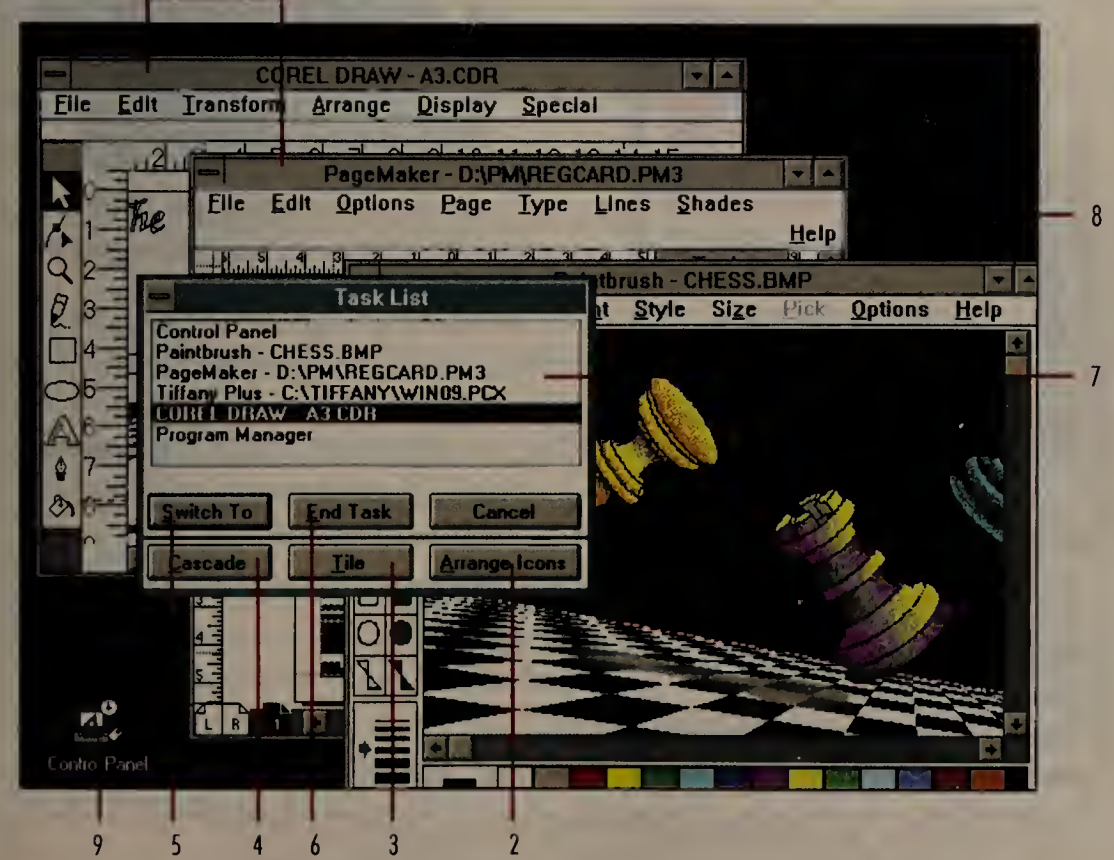


Inside an Application: Working With Dialog Boxes and Menus



1. CONTROL MENU BOX: APPLICATION
   Double-click to close program.
2. CONTROL MENU BOX: DOCUMENT
   Double-click to close file.
3. CLICK TO CONFIRM CHOICES.
4. CLICK TO CANCEL CHOICES.
5. PAGE SCROLL ICONS
   Click to jump up or down to next page.
6. STATUS LINE
   Notes current function, page, column, row, or other information.
7. TEXT BOX
   Type information here.
8. OPTION BUTTONS
   Exclusive options. You can select only one option.
9. CLICK TO DISPLAY LIST BOX.
10. LIST BOX
    Pick from available options.
11. CHECK BOX
    Nonexclusive options. Pick as many as needed. Click on box again to deselect option.
12. DIALOG BOX
    Supplies information, displays options, and requests data from user.
13. DOCUMENT WINDOW
    Where data file appears.

Managing Multiple Applications With the Task List



1. OVERLAPPING WINDOWS
   Click on a window to bring it to the top of the stack. Only one window can be active at once; its title bar will change from white to a color.
2. STRAIGHTENS ANY ICONS ON THE DESKTOP.
3. TILES PROGRAM WINDOWS.
4. OVERLAPS PROGRAM WINDOWS.
5. BRINGS SELECTED APPLICATION TO TOP OF THE STACK.
6. CLOSES SELECTED APPLICATION.
7. TASK LIST
   Press **<Ctrl>-<Esc>** at any time to summon this list of all loaded applications. To display an application's window, select the name and double-click, or click on the 'Switch To' button.
8. DESKTOP
   Where all windows and icons reside. Double-click to summon the Task List.
9. PROGRAM ICON
   Represents minimized program. Double-click to restore its window.

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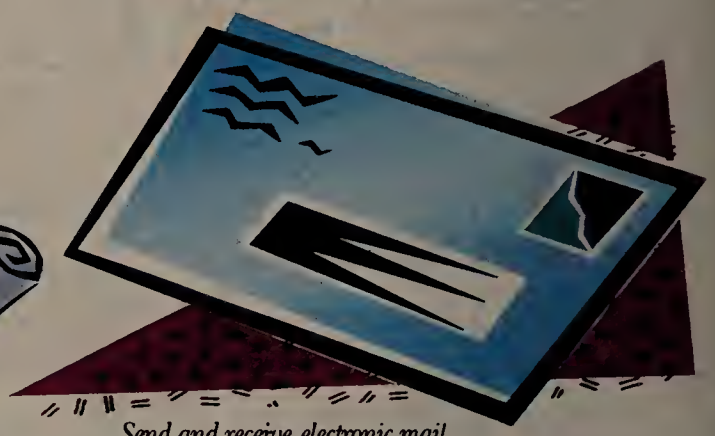

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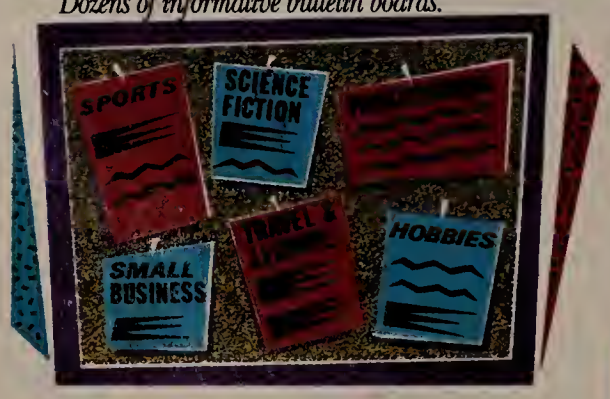

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DOS

stroke stroke stroke
stroke stroke stroke
stroke stroke stroke
stroke stroke stroke
stroke stroke stroke
stroke stroke stroke

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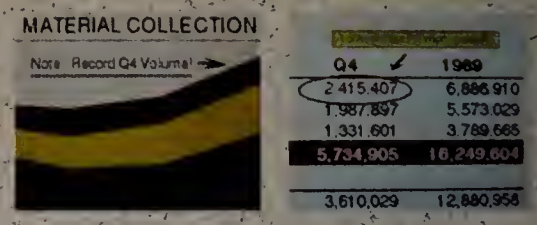

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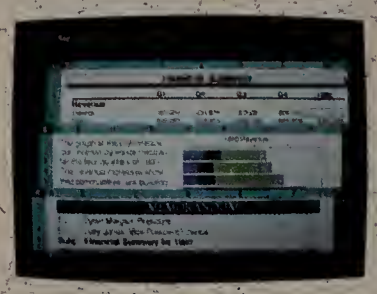

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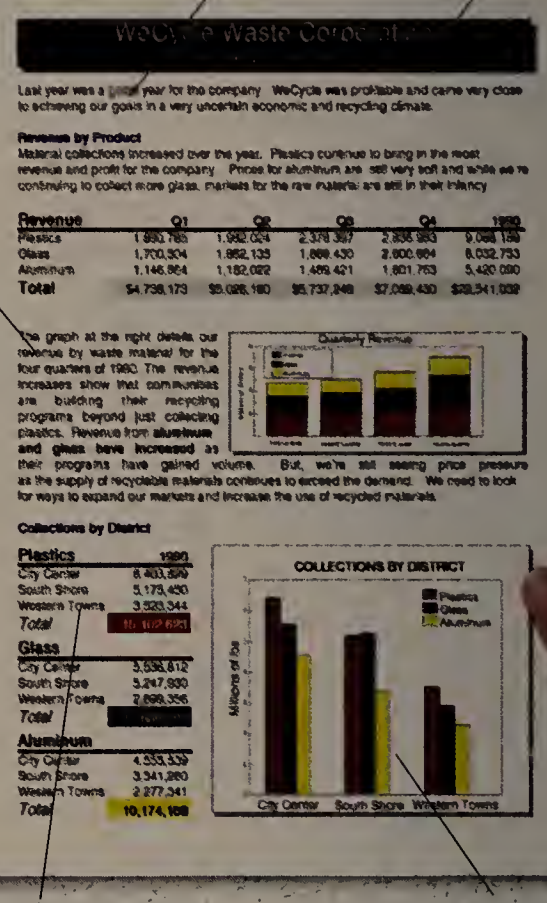

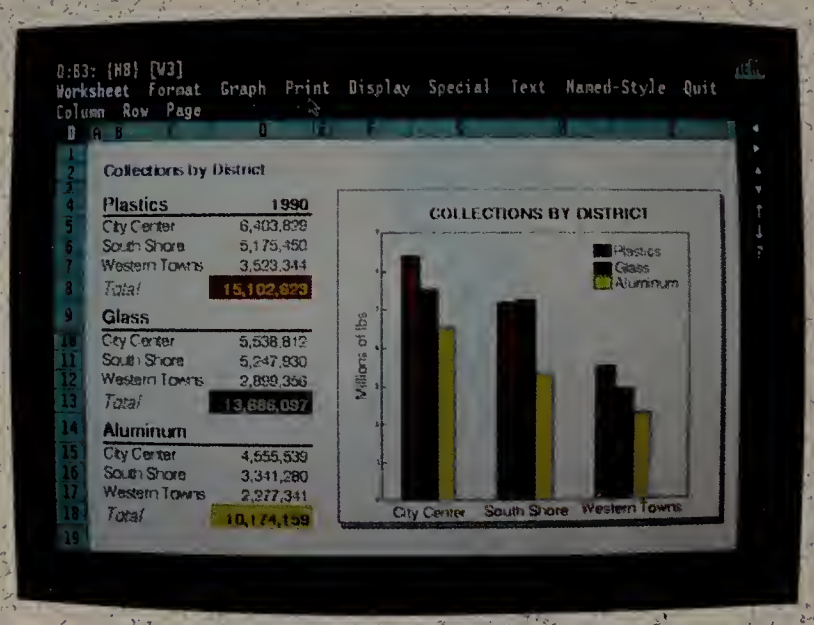

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Words Into Print

Word Processing

Tips for getting the most out of your word processor

This month: Master WordPerfect footnotes and endnotes, and automatically print odd or even pages in Word.

George Campbell

Footnotes and endnotes are not frequently used in business documents, but sometimes nothing else will do. Business reports can benefit from a few well-chosen notes, and academic and technical papers often bristle with them.

Use notes only when they provide information that would otherwise disturb the flow of your main text. If your point is of interest to only a few readers, add a note. References to research sources and historical anecdotes are good candidates.

Footnotes appear on the same page as the reference number; endnotes appear at the end of a section or document. Because endnotes force the reader to flip to a new page, footnotes are preferable. Use endnotes only when multiple notes would hinder reading or when the notes are bibliographic in nature. You might also consider endnotes if your footnotes approach the size of body text paragraphs. Some word processors let you mix both types, but that can lead to confusion.

WordPerfect Notes: A Tutorial

Most word processors include tools to automate footnote creation. Here's a step-by-step guide for *WordPerfect 5.0* and *5.1*.

To create a note, position the cursor where you want to place the note's reference number, and press **<Ctrl>-<F7>**. Press **f** for a footnote or **e** for an endnote, and then press **c**. Type the note's text, then press **<F7>**.

To delete a note, move the cursor to its reference number, then press **<Delete>y**. To edit a note, press **<Ctrl>-<F7>**, press either **f** or **e**, and then type **e**. Enter the note's number, press **<Enter>**, and then edit the text and press **<F7>**. When you insert or delete a note, renumbering is automatic, but the change won't appear on screen until you move the cursor.

By default, *WordPerfect* numbers notes continuously. In long documents, however, you'll probably want the notes in each section to begin with 1. Place the cursor wherever you want to begin renumbering, then press **<Ctrl>-<F7>**. Press **f** or **e**, and then type **n**. Type the new number, **1**, and press **<Enter>**.

WordPerfect normally prints end-

WORD SHORTCUT

Print Odd or Even Pages

By default, *Word* can't print just odd- or even-numbered pages. This *Word 5.0* macro adds that capability, enabling you to print two-sided documents easily. Simply print the odd pages, flip and reorder the paper, and then print the even pages.

Type the actual characters below on a blank *Word* screen. Press **<Ctrl>-[** and **<Ctrl>-]** to create chevrons (« »).

```
«SET echo = "off"»
<ctrl pgdn><ctrl esc>jp
«SET last = field»<esc><ctrl pgup>
«ASK EorO=?Enter O for Odd or E for
Even pages.»
«IF EorO = "O" OR EorO = "o"»«SET
start = 1»«Endif»
«IF EorO = "E" OR EorO = "e"»«SET
start = 2»«Endif»
«SET ppage = start»
«WHILE last > ppage»
«SET ECHO = "on"» <esc>
po<down 4>p<tab>«ppage»
<enter><enter>
«SET ppage=ppage+2»
«ENDWHILE»
<esc>po<down 4>a
<enter><esc>
```

To save the macro, press **<Shift>-<F10><Esc>c**, type **OddEven.Mac**, and press **<Enter>**. To store the macro permanently, press **<Esc>tgs <Enter>**. To use the macro, press **<Esc>i**, type **OddEven.Mac**, and press **<Enter>**. When prompted, enter **e** for even or **o** for odd pages, and press **<Enter>**. —*G. C.*

notes at the end of the document. To place endnotes after each section instead, move to the section's end, then press <Ctrl>-<F7>p. You can restart endnote numbering here by pressing y. Press n to maintain the sequence. Ignore the comment box warning that appears at the endnote position.

Design Tips for Attractive Notes

WordPerfect's default note format should please most users, but you can change it if you want. Move to the top of the document, and press <Ctrl>-<F7>, then f or e. Next, press o to view the options menu, shown in **SCREEN 1**. For endnotes, only the first five options appear.

The first menu option sets line spacing. The default single-spaced footnote text is usually best. If you use a small font in notes, however, decrease the space between the lines. Footnote text is usually slightly smaller than regular text. If your body text uses 12-point type, try 10-point type for notes.

The second option lets you decide the minimum amount of footnote text that must appear on the same page as its reference before the rest is bumped to the next page. The half-inch default is usually fine.

```
Footnote Options

    1 - pacing Within Footnotes          1
              Between Footnotes          0.167"

    2 - mount of Note to Keep Together   0.5"

    3 - Style for Number in ext          [SUPRSCPT][Note Num][suprscpt]

    4 - Style for Number in ote                [SUPRSCPT][Note Num][suprscpt

    5 - Footnote Numbering ethod         Numbers

    6 - Start Footnote Numbers each age  No

    7 - ine Separating Text and Footnotes 2-inch Line

    8 - Print ontinued Message           No

    9 - Footnotes at ottom of Page       Yes

Selection: 0
```

SCREEN 1: With this Footnote Options menu, WordPerfect users have complete control over the position and appearance of footnotes.

The next two options control reference mark appearance. The default is a superscript in the normal font. To change point size, use the <Ctrl>-<F8> text formatting tools. Unfortunately, you can't set universal text formatting for every footnote in a document—instead, you have to format each note individually. You can automate the note formatting process, though, with the macro in this month's *WordPerfect Shortcut*.

Next, you can choose reference mark characters. Numbers are the default, but letters or characters are options. If you must use footnotes *and* endnotes, use numbers for one and letters for the other. If you need just a few notes, try asterisks. *WordPerfect* inserts one asterisk, then two, and so on.

The sixth option lets you restart numbering for notes on every page. Try this if you use asterisks to mark notes.

WordPerfect next lets you select a rule to separate footnotes from body text. The well-chosen default is a 2-inch line, but a margin-to-margin line or no line are also options.

As a default, *WordPerfect* prints *continued...* when it breaks a note, but you can turn this feature off. Finally, you can force footnotes to the bottom of a partial page of text, such as at the end of a chapter.

If you're like most business users, you probably use footnotes only rarely. But it pays to follow some basic design tips when you do. ●

George Campbell is a contributing editor for PC World.

WORDPERFECT SHORTCUT

Customizing Footnote and Endnote Text

WordPerfect forces you to format footnote text one footnote at a time. Create the macros below to automate this time-consuming job:

1. To start recording, press <Ctrl>-<F10> on a blank *WordPerfect* screen.
2. Press <Alt>-f or <Alt>-e for footnotes or endnotes, then type **Footnote** or **Endnote**; press <Enter>.
3. Press <Ctrl>-<F7>, f or e, then c.
4. Press <Ctrl>-<F8>, then choose base font, size, and appearance for all footnote text.
5. Press <Ctrl>-<F10><F7> to end recording.

Now, to insert a preformatted note, press <Alt>-f or <Alt>-e, type your text, and press <F7>.
—*G. C.*

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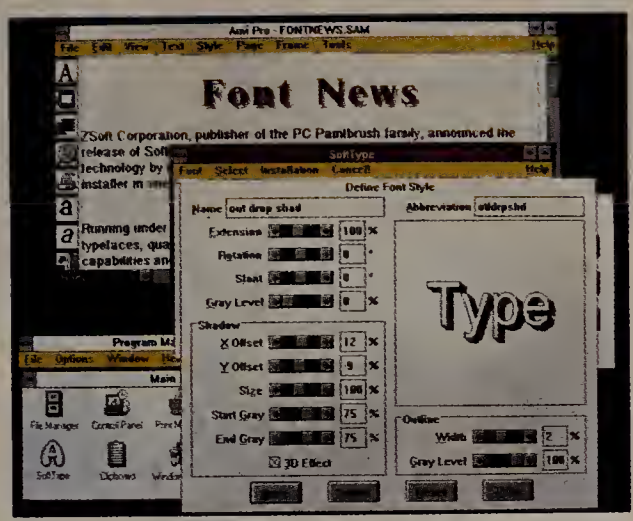

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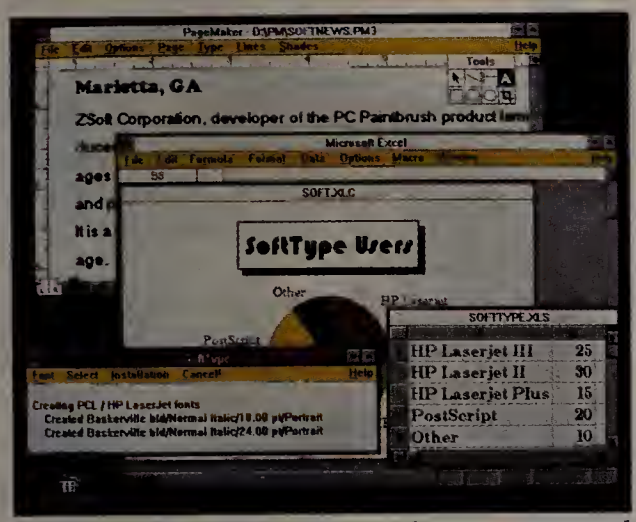

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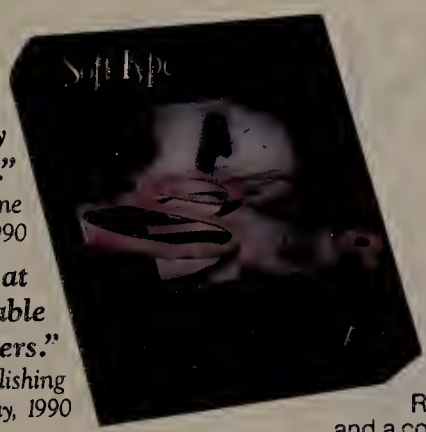

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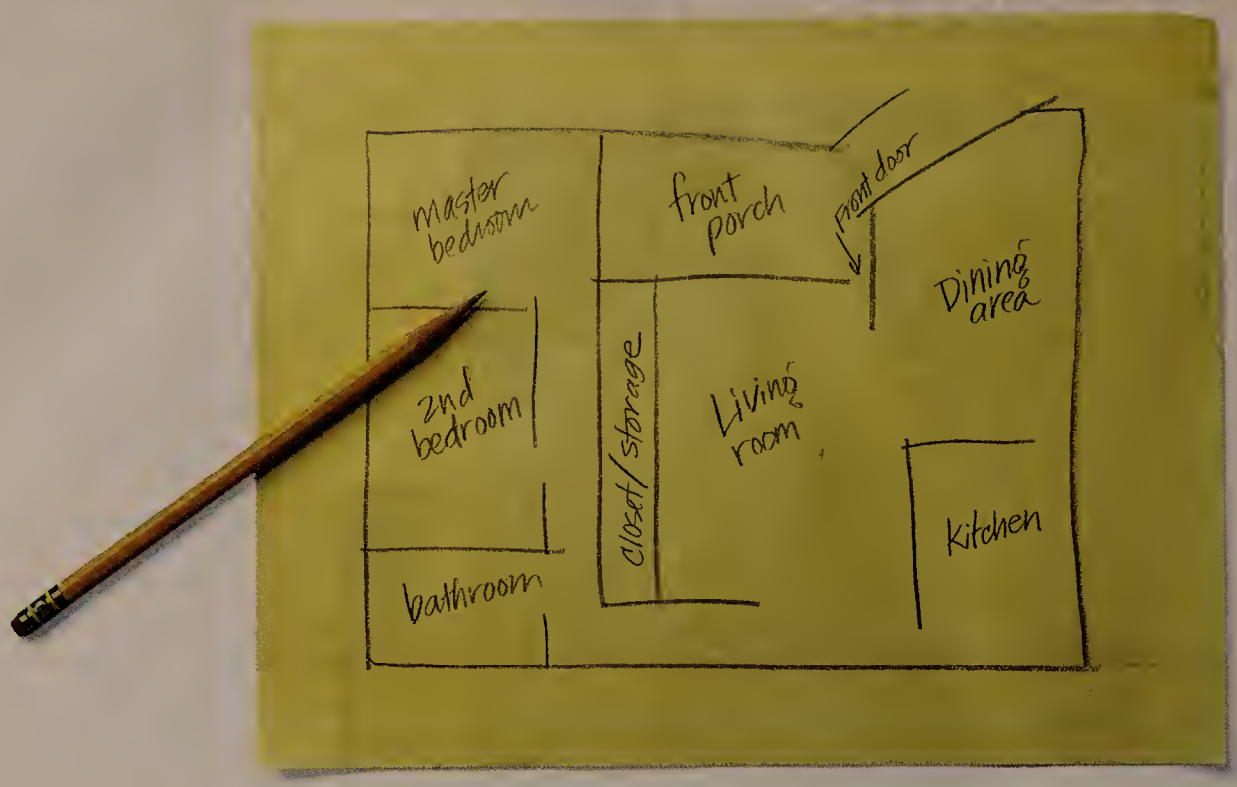

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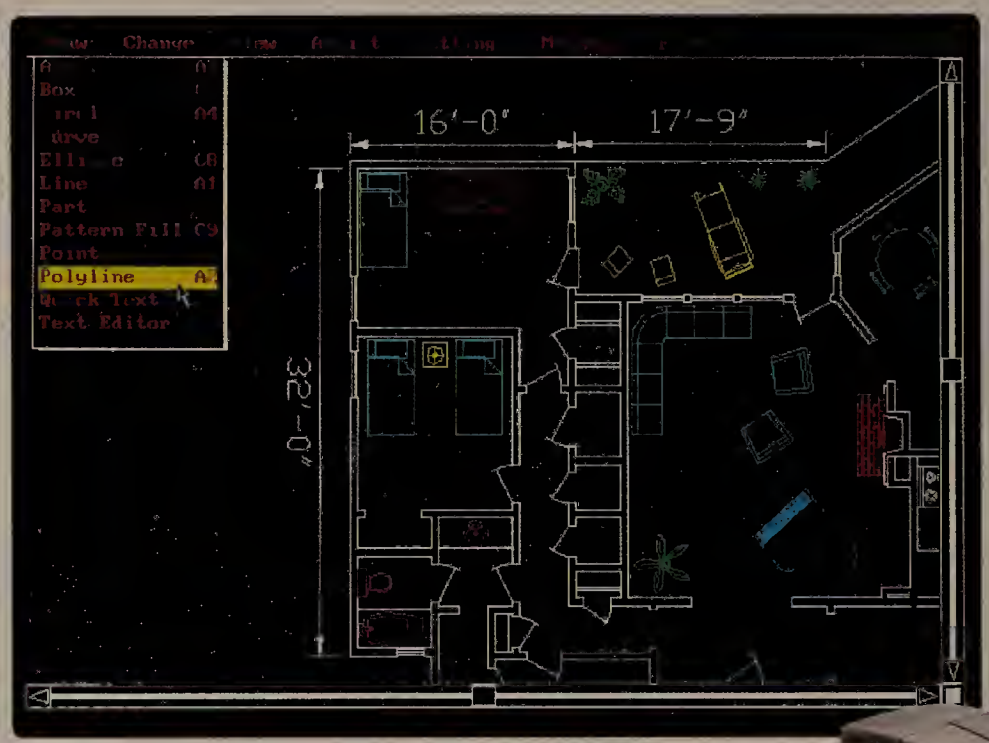

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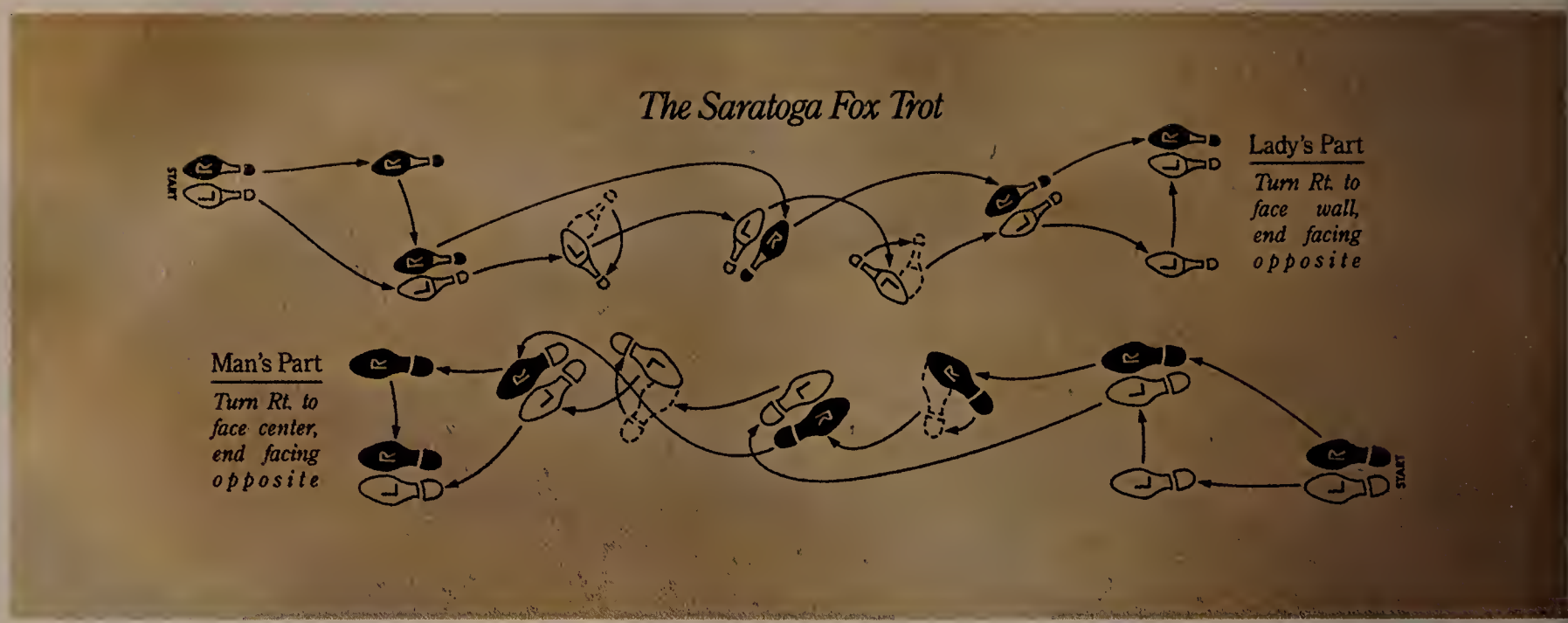

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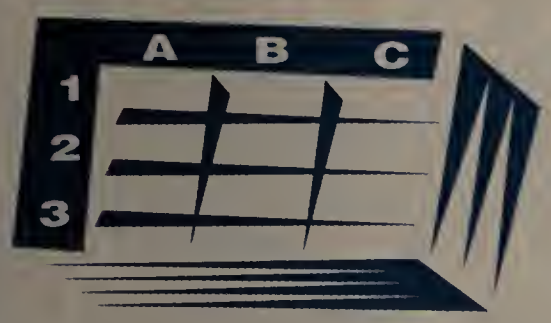
Circle 62 on reader service card

Spreadsheets (A..Z)



Spreadsheets

Practical tips for building better worksheets

This month: Let's get graphic!

Richard Scoville

Graphs are the icing on the spreadsheet. Strutting your spreadsheet's results in a concise graph will help you (and your audience) understand what all those numbers mean. This month, we'll cover the basics of *1-2-3* release *2*.x graphs by generating the chart shown in **FIGURE 1** from the worksheet below it.

The Graphic Essentials

Every *1-2-3* graph is based on the data found in a series of ranges. In **FIGURE 1**, for example, B1..E1 (range name x-labels) holds the labels for the horizontal (*x*-)axis; B2..E2 (east_data) and B3..E3 (west_data) are the data ranges, whose values determine the height of the bars.

To build the sample graph, first enter the values and labels shown in **FIGURE 1** in cells A1..E3 of an empty worksheet. Then define the range names shown in the table at F1..G5. To do so, select */Range Name Create*, type the range name **East_Data**, and enter **b2.e2**. Repeat the process for the four remaining range names. To document the names on the worksheet, select */Range Name Table* and enter **f1**; the table will appear. Next, widen column F using */Worksheet Column Set-width*, and enter **12**. Finally, format the worksheet by selecting */Worksheet Global Format Currency* and entering **0**.

Now let's create the graph. Select */Graph* and then *Type Bar* to create a bar chart. [For more information about graph types, see "Ten Graphs (and How to Use Them)," September 1988.] Next, set up the graph ranges: Select *X*, press **<F3>**, choose *x-labels* in the Range Name menu, and press **<Enter>** to place the labels in cells B1..E1 along the horizontal graph axis. Select *A*, press **<F3>**, and select *east_data* as the first data range. In the same way, select data range *B* and designate it *west_data*. Then select *View* to see your graph on screen. (If you get only a beep and a blank screen, check that *1-2-3* is installed properly. Also, remember that you need a graphics monitor to view *1-2-3* graphs.) Press any key to return to the graph menu.

Options, Options

To add titles to the graph, select *Options Titles First*, and enter the top graph title: **West Retains Sales Dominance.** Select *Titles Second*, and enter **Fisbo 1990 Gross Sales.** Do the same for the *y*-axis title, **Millions of Dollars.**

The dollar amounts shown above the

SPREADSHEET TOOLBOX

Find Optimal Solutions With What-If Solver

Let's say you're the treasurer of a pension fund. Your goal is to invest your members' deposits and reap the maximum profit with the minimum risk. But each investment presents different interest rates, maturation periods, and risk levels. How do you decide where to put the money?

You could use the time-honored (but imprecise) method of plugging guesses into data cells until the numbers looked right. But there's a better way: *What-If Solver*, a *1-2-3* add-in that finds optimal solutions for spreadsheet models.

What-If Solver's nonlinear algorithms can handle a much broader range of problems than the linear methods found in *Quattro* or *SuperCalc* can, and because its intuitive menus shield you from the esoterica of advanced mathematics, *What-If Solver* is much easier to use. Unlike similar products, *What-If Solver* works just fine on existing spreadsheet models, and the documentation provides a number of clearly described case studies. It gets an A+!
—*Richard Scoville*

What-If Solver $199.95; Frontline Systems, 140 University Ave. #100, Palo Alto, CA 94301; 800/451-0303 ext. 55, 800/542-2159 (fax-back)
Reader service no. 601

	A	B	C	D	E	F	G
1		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	EAST_DATA	B2..E2
2	East	$100	$131	$253	$198	EAST_LABEL	A2
3	West	$343	$243	$421	$399	WEST_DATA	B3..E3
4						WEST_LABEL	A3
5						X-LABELS	B1..E1

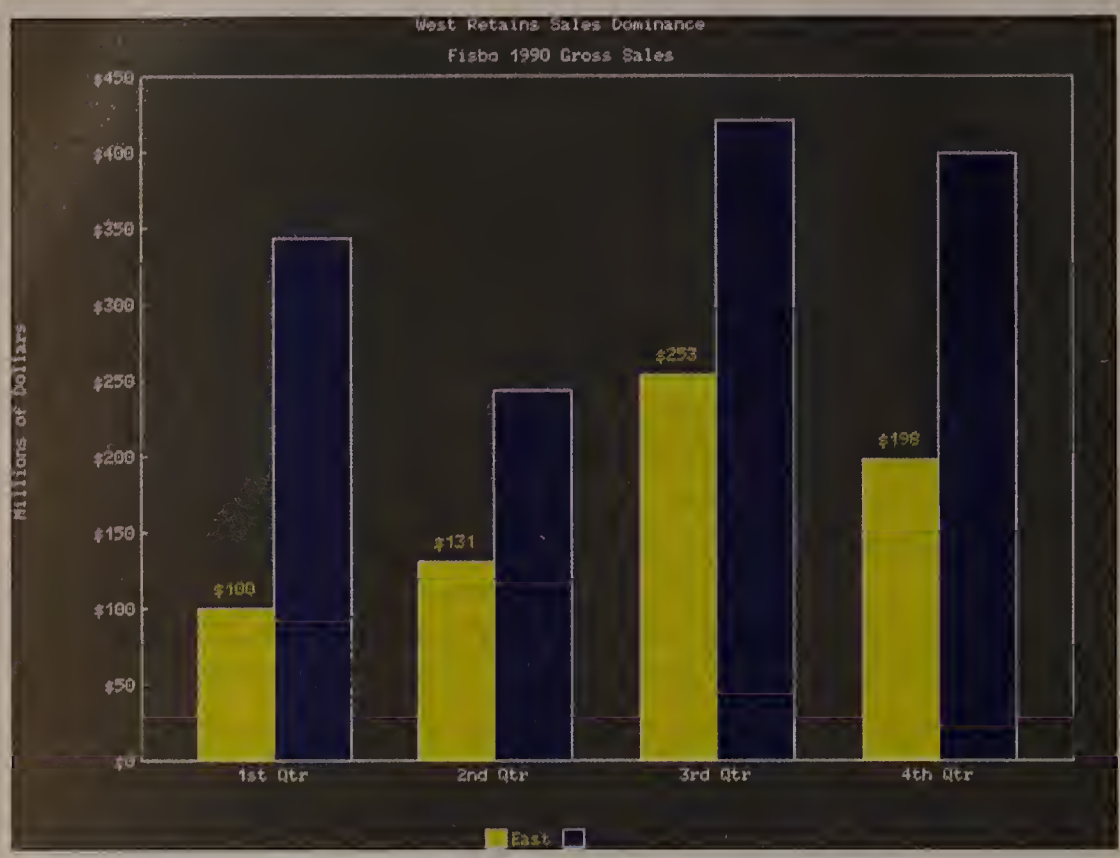


FIGURE 1: Note the relationship between the sample chart and the worksheet entries that generate it: The entries in cells B1..E1, for example, are used to label the x-axis. The data labels above the bars—figures that appear in worksheet cells B2..E2 and B3..E3—are used to clarify the amount represented by each bar.

bars are data labels—cell entries that appear near data points in the graph. Select *Data-Labels A*, press **<F3>**, select *east_data*, then select *B* and *Above* to place the numbers above the bars. In the same fashion, specify *west_data* as the data label for data range B. Select *Quit* to return to the Options menu.

To add dollar signs to the numbers on the vertical axis, select *Scale Y-Scale Format Currency*, enter **0** for no decimal places, and select *Quit* to return to the Options menu.

Finally, we'll define the legend to identify the East and West bars in each group. Although you can enter legend text just as you did the titles, link the legend to the labels in cells A2 and A3 instead (named east_label and west_label, respectively). This procedure makes the legends dynamic: When the cell text changes, the legend changes too (this trick also works with titles). Just select *Legend A*, and enter **\east_label**; then select *Legend B*, and enter **\west_label**.

Print It!

*1-2-3 2.*x cannot print its own graphs directly. You must first save your graph in a special PIC file, then print it with the supplied *PrintGraph* utility—or better yet, insert it into an *Allways* report [see *Spreadsheets (A..Z)*, May 1990]. You can also import the file into a word processing program that supports *1-2-3* graphs.

Unless you're using a color printer or plotter, select *B&W* in the Graph Options menu, then *Quit* to return to the Graph menu. Select *Save*, enter an appropriate file name ("fisbo," for example), and press **<Enter>**. Now you can print the graph using the method of your choice. But don't forget to save the worksheet you've used to create the graph first.

1-2-3 graphs are simple once you master a few of the options. Stay tuned for next month's column, where we'll show off some fancy graphing tricks.

Richard Scoville and Ralph Soucie are contributing editors for PC World.

EXCEL SHORTCUT

Spruce Up Your Charts With Text and Labels

Ralph Soucie

Adding free-floating text to *Excel* charts is easy, but how to do it is not immediately obvious. Just select the chart and start typing; the text will appear in the formula bar. Press **<Enter>**, and drag the new text item into place. Choose *Format Text* to alter its font or colors. If you want to emphasize the text's subject with an arrow, choose *Chart Add arrow*, then click on the end of the arrow and drag it into position.

You can also use *Excel*'s default label options. To put a title at the top of your chart, select *Chart Attach text Title*, type the appropriate text, and press **<Enter>**. Similarly, you can label the *x*- and *y*-axes using *Chart Attach text Category axis* and *Chart Attach text Value axis*, respectively. You can alter an attached label's appearance with *Format Text*, but if you want to change its position you must replace it with a free-floating label.

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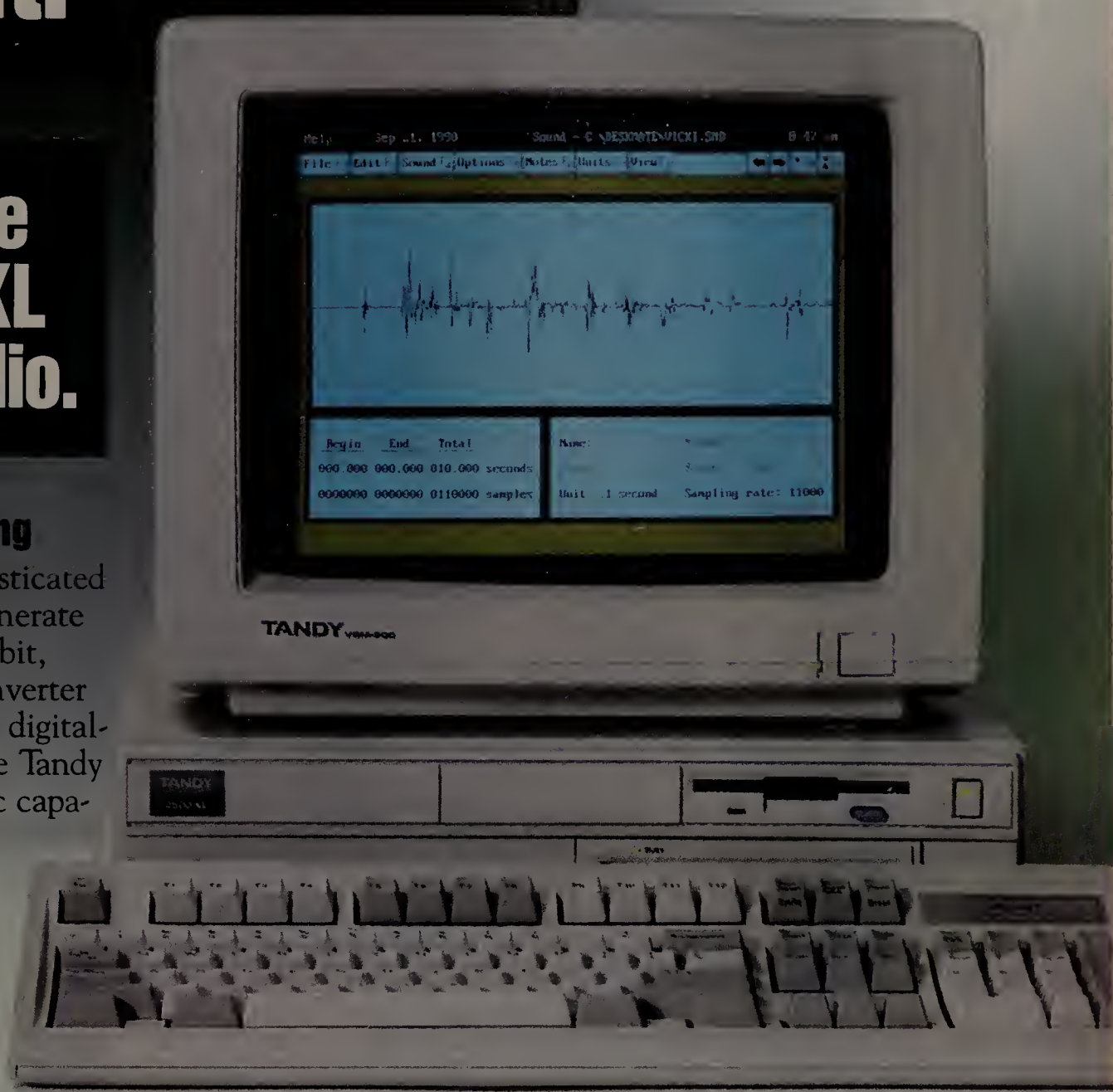

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Data Basics

Data Management

Tips and techniques for managing your data

This month: getting your reports off to a good start

Alan Schwartz

Effective data base reports turn data into information, but if your readers can't tell what they're looking at, the report is nothing but a dead tree. An informative title and clear column headings go a long way toward telling a report's story. This month we show you how to use these elements effectively.

Use two-part report headlines. For the title, carefully choose descriptive words commonly employed in your business, which never change. Next, build a modifiable heading, which identifies the data set on this particular report. This is especially important if you use the same report form (or layout) for more than one type of report.

Suppose you use the same layout to generate two reports on customers but select the listings by different criteria. One report might show all of your customers, while the other might include only those who haven't bought anything this year. Using the same report form not only saves you time, but if you use a layout consistently, your co-workers will know, for instance, that the last purchase date is always in the fifth column. But if both reports have the same headline, you'll have some confused and angry co-workers.

Everyone will be much happier if you name these reports something like "Customers" and "Inactive Customers (No Purchase in 1991)." Most data managers let you supply report headings at run time. To see how this is done in *dBASE* and *Paradox*, check out the accompanying shortcuts.

Sorted Details

The heading can do double duty by telling your readers what order the records are in. Most people assume that a report is sorted by—printed in the order of—its left-hand column. It's therefore best to design a report form with the sorted column (be it Name, ZIP, or whatever) on the left, but that's not always possible, especially if you're using the same report form for a number of reports. The solution: Specify the sort order in your heading, as in "Inactive Customers (No Purchase in 1991)—By ZIP."

At the Head of the Column

After the report heading, the column headings are the best clues to what's on the report. The easiest (but not necessarily the smartest) thing to do is sim-

PARADOX SHORTCUT

Reporting From a Query

Celeste Robinson

Paradox offers no direct way to print a report of only *some* of the records in a table. If you need a list of customers added since last July, for instance, you can't use your Customer table's Report R to print it. But you *can* create an *Ask* query that lists only those customers, then use the *Tools Copy Report* command to copy your report form from the Customer to the Answer table. Printing Answer's report rather than Customer's will give you the selection you want.

But even then, the report's title won't state which customers are listed, and *Paradox 3.0* has no way to change a report title when you print it. So, before printing the report, you'll have to use the *Report Change* command to change the name manually. Do this after you've copied the report to the Answer table, and be sure to change the name of the copy, not the original, so your change isn't permanent.

If you have *Paradox 3.5*, changing the title is much easier. When creating or changing the report, put a calculated field in the title's place, using a variable name as the expression. From then on, changing the contents of the variable will change the title of the report (<Alt>-<F10>*MiniScript* is an easy way to do this).

Clarifying Your Report

Difficult to read:

NAME	DATE POSTED	DUE
Michael Maltese	12/15/90	1835.65
Ginger Morgan	01/08/91	245.73
Joseph Mulligan	11/13/90	13679.38
Sylvia Mahari	2/6/91	16.52

Easy to read:

Name	Date Posted	Due
Michael Maltese	12/15/90	1835.65
Ginger Morgan	01/08/91	245.73
Joseph Mulligan	11/13/90	13679.38
Sylvia Mahari	2/6/91	[illegible]

FIGURE 1: Justify each column heading to be directly over the data in its column, use a mixture of uppercase and lowercase letters, and place a line under each column heading. Your report will be much more readable.

ply accept the default in many report writers and use the field names provided. If the fields have simple names like "Phone," that's no problem, but a column headed "DTPOST" will confuse the boss. Therefore, when the field name is a code or abbreviation, spell it out in the column heading; for instance, "Date Posted" is much easier to understand at a glance than "DTPOST." If your descriptive column heading is wider than its column, split it into two lines. You can do this with virtually all report writers.

Once you've spelled out your column headings, format them for easy reading. Parallel justification is important; a left-justified or centered heading will look confusing over a column of right-justified numbers. As a general rule, you should left-justify character column headings, center those above dates and long descriptions, and right-justify headings over numbers.

Other column-heading design tips: Use uppercase and lowercase letters; they're easier to read than all caps or all lowercase. And put a line below each column heading, stretching the full width of the column (see **FIGURE 1**).

If you've put some thought into your report heading and column headings, the people who read your reports will be happier. In the long career run, this will make you happier as well.

Alan Schwartz is a partner in Micromega Systems in San Francisco, specializing in custom data base applications development. Celeste Robinson is the author of The Best Book of Paradox *(Howard W. Sams and Co., Carmel, Indiana, 1990).*

DBASE SHORTCUT

Naming Reports as You Print Them

How would you go about printing, from a data base of all your customers, a report of just those customers added since last July? Assuming your report form is called CUSTLIST.FRM and your date field is called First_sale, the obvious answer is to use the command **REPORT FORM Custlist TO PRINT FOR First_sale >= CTOD("07/01/90")**.

One extra step will give your report a title that accurately reflects the data in the new report. The dBASE REPORT command has a little-used HEADINGS option that lets you add a title at print time. If you change the command above to **REPORT FORM Custlist TO PRINT FOR First_sale >= CTOD("07/01/90") HEADING "Customers Added Since July 1, 1990"**, the resulting report will be much clearer to your co-workers. —*A. S.*

POWER TIP NO. 163

A Quicker Exit

If you frequently shell out of applications or an environment, you probably get plenty of practice typing 'exit' and pressing <Enter> to return to your application. You can save yourself some keystrokes by creating a batch file called E.BAT that contains the line exit and placing it in a directory listed in your system's PATH command.

Rex Farrance
Assistant Editor

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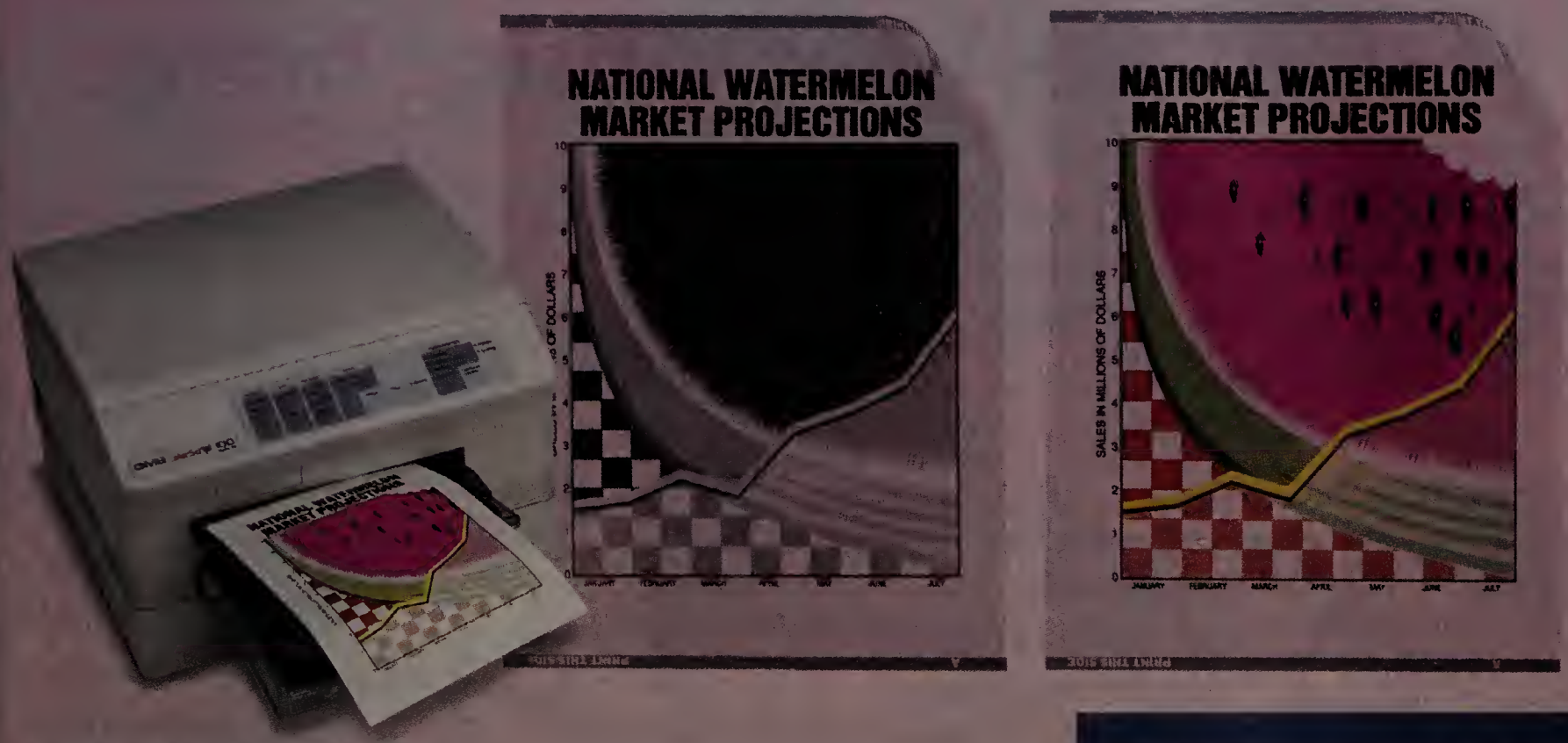

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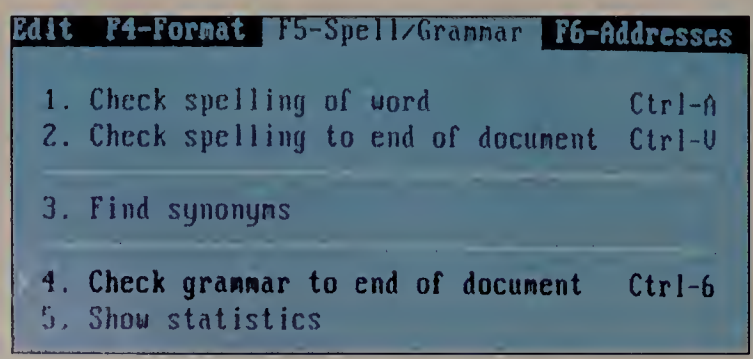

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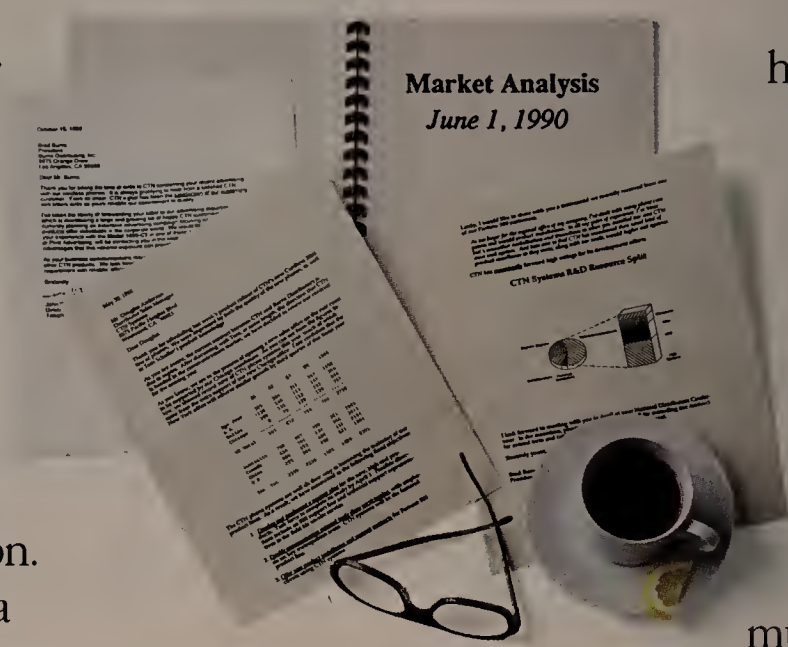

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The Art of Persuasion

Publishing & Graphics

Expert advice for creating high-impact documents and presentations

This month: choosing typefaces that mean business, and scaling bit-mapped graphics in Ventura

Richard Jantz

These days, virtually everyone has access to thousands of typefaces. Low-cost font generators like *Fontware*, scalable-font cartridges, and cheap PostScript printers make it easier than ever to add attention-grabbing typefaces to your newsletters, presentations, and brochures.

But using flashy fonts in a business report or training manual is like wearing a plaid suit to a board meeting. Such documents demand a conservative, businesslike image. Fortunately, that doesn't mean you're stuck with your laser printer's boring Times Roman (Dutch) or overused Helvetica (Swiss) fonts.

The key to elegant-looking business documents is using the right *typeface family*, which includes all styles (such as bold or italic), widths (condensed or expanded), and weights (light or heavy) of a particular typeface. This month we offer advice on choosing a typeface family, plus tips on designing a standard business report.

Finding the Right Type

Since you'll be using a single typeface family for both headlines and body text, look for one that offers strong contrasts between its styles, widths, and weights. Good picks include ITC Bookman, New Century Schoolbook, Palatino, Avant Garde, Futura, and Univers.

Check type samples printed in the sizes and resolution you plan to use. Some typefaces printed at 300 dots per inch (dpi) are difficult to read at sizes of less than 10 points because the ink toner fills in the enclosed portions of letters like *e* and *o*. Try to compare samples of the same typeface from different vendors—they'll often vary widely in quality and appearance. And if you're printing the finished product at a service bureau, make sure your fonts can be output at that site: Typefaces from smaller vendors aren't always supported by professional typesetting equipment. When in doubt, stick with fonts from major type vendors.

Business Documents: All in the Family

Corporate Training

Training Materials

The Corporate Training department has identified a priority objective to redesign and reformat over 9,000 pages of textual and graphic information which constitutes the Corporate training documentation materials. In addition to redesigning this substantial amount of information, the Training department will also add new sections to the current training curriculum. The training documentation is currently available in a variety of media, mostly on photocopied paper. However, approximately *80 percent of all existing documentation is out of date* since the introduction of new Corporate products in 1990. According to the Corporate Director of Training, there is no orderly fashion or design for updating this information.

Consultant Services

To update the Corporate training materials as quickly as possible, the Corporation has hired a training consultant firm, Malinowski and Associates, to design a specific format and process for updating all Corporate training documentation. Malinowski and Associates will also assist in hiring and training permanent staff to coordinate the processes of rewriting the documentation.

Table III-1: Projected Cost of Training Materials

	1991	1992	1993	1994
Material Costs	177,688	181,234	184,858	188,555
Packaging Costs	7,107	7,249	7,394	7,542
Shipping Costs	11,194	11,418	11,644	11,879
Totals	195,989	199,901	203,896	207,976

Note: Personnel costs provided under separate cover.

Cost Projections

According to current projections, the cost for Corporate training materials will rise from approximately $196,000 in 1991 to $208,000 in 1994, as shown in Table III-1. Although the Corporate R&D division includes an in-house printing and typesetting shop, the Training department does not have priority access to this facility. Due to the size of the training materials project, a decision has been made to evaluate work-group desktop publishing solutions specifically for the Training department.

Corporate Business Plan III-21

Main heading: 48 pt. bold roman
Subhead level 1: 24 pt. bold italic
Body text: 12 pt. roman
Subhead level 2: 14 pt. bold roman
Emphasis in body text: 12 pt. italic
Table (or figure) head: 14 pt. bold italic
Table column heads: 12 pt. bold roman
Table text: 12 pt. roman
Caption: 10 pt. bold italic
Footer (or header): 10 pt. roman

How can you add life to a standard business report if you're using only one typeface family? By mixing different type styles, weights, and sizes. But be careful: If you use too many contrasting elements you can quickly turn your document into an eyesore.

NUTS & BOLTS

Scaling Bit-Mapped Graphics in Ventura

When you import a bit-mapped graphic into *Ventura*, the program accurately reproduces the image's height-to-width ratio and fixed-dot pattern. But if you enlarge the graphic, the dot pattern is often distorted. The solution? Use *integer multiples*—whole number multipliers such as 2 or 3—when you resize a bit-mapped image. *Ventura* will then redraw the image with all the dots in their proper places. Here's how to enlarge and crop a sample *Ventura* graphic:

1. Start *Ventura*, switch to Frame mode, and draw a frame 3 inches square.

2. Select *File Load text/picture*, and load the sample CHANEL.IMG file found in the Typeset directory. *Ventura* automatically fits the image in the frame.

3. Select *Frame Sizing & scaling*, then *By scale factors*. The 'Scale width' line displays the image's width, 01.51 inches. To make the image four times larger, simply multiply the original width by 2 and enter the total (03.02 inches) as the new scale width. Select *OK*, and *Ventura* quadruples the size of the image.

4. To crop the graphic, hold down **<Alt>**, select the image, and move it around until it's displayed correctly inside the frame. —*R. J.*

DESKTOP PUBLISHING TOOLBOX

Safe Harbor for LaserJet Font Users

Feeling adrift in a sea of font options? Let *The LaserJet Font Book* come to the rescue. This comprehensive resource helps owners of HP's LaserJet Series II and III printers choose and use fonts effectively. In addition to type design tips, the book provides samples of more than 1000 bit-mapped and scalable typefaces from popular vendors. Font specimens comprise the bulk of the 332-page book and range from book faces to display and specialty fonts. Best of all, the samples are printed at 300 dpi, so you can see which look best at sizes from 8 to 72 points.

Author Katherine Shelly Pfeiffer and contributor Daniel Will-Harris provide advice on using font-scaling packages (*Adobe Type Manager* and *Publisher's Powerpak* among them), plus tips on using fonts found in drawing programs like *Corel Draw* and *Designer*. If the problem of adding fonts to your laser has you floundering, this $24.95 book could be a lifesaver. —*R. J.*

The LaserJet Font Book $24.95; Peachpit Press, 1085 Keith Ave., Berkeley, CA 94708; 800/283-9444
Reader service no. 643

Getting Down to Business

Here are some tips for designing a simple business report, like the one shown in the figure.

- Use bold type for headlines, and bold italic type for major subheads. To lend the page a symmetrical appearance, use multiples of the body text size to determine the sizes for heads. For example, with 12-point body text, use a subhead that's twice the size (24 points) and a headline three or four times as large (36 or 48 points).
- Use 10- to 12-point roman ("normal") type for all body text. Use italic type of the same size to indicate book titles, foreign words, and technical terms.
- To differentiate minor subheads from body text, set them in bold type at 12 to 14 points.
- Condensed (narrow) and lighter-weight (light) versions of a typeface are useful when you have to fit lots of body text into a small space—for example, in a table or directory. Use 12-point to 14-point type for figure and table headings, and 10- to 12-point type for the body text of tables.
- Use expanded (wide) and heavier (extrabold, demi, black) versions of a typeface for display text and special elements like logos and large capital letters. Heavier faces are especially handy for long headlines—their increased weight lets you use a smaller point size without diminishing the head's importance.
- For headers and footers (information at the top or bottom of a page that identifies its contents) and footnotes, use roman type set slightly smaller than body text.

Most important, keep things simple. Even though some type families offer a wide range of harmonious variations, less is usually more when it comes to mixing up different type styles, weights, and sizes in a typical business report.

Richard Jantz is a contributing editor for PC World.

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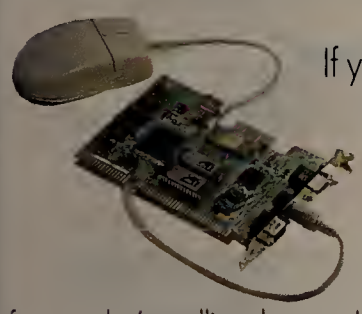

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Circle 302 on reader service card

HIGHLY RECOMMENDED

When Accounting Today (May 1990) asked accountants which accounting software package they recommended to their small business clients, an overwhelming 29% said they recommend Peachtree Accounting– that's almost double the next largest competitor.

Reseller Management (March 14, 1990) asked resellers which accounting package they recommend and Peachtree came out on top again with 25% of resellers recommending it.

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"If you could find a definition for Peachtree in the dictionary, it might be 'value for your money.'"–PC Magazine 4/10/90

"It is, I believe, the best accounting package available for the price."–E.J. Bosmeny, CPA, Naperville, IL

"Complete III rivals packages costing 10 times as much."–PC Resource, July 1990

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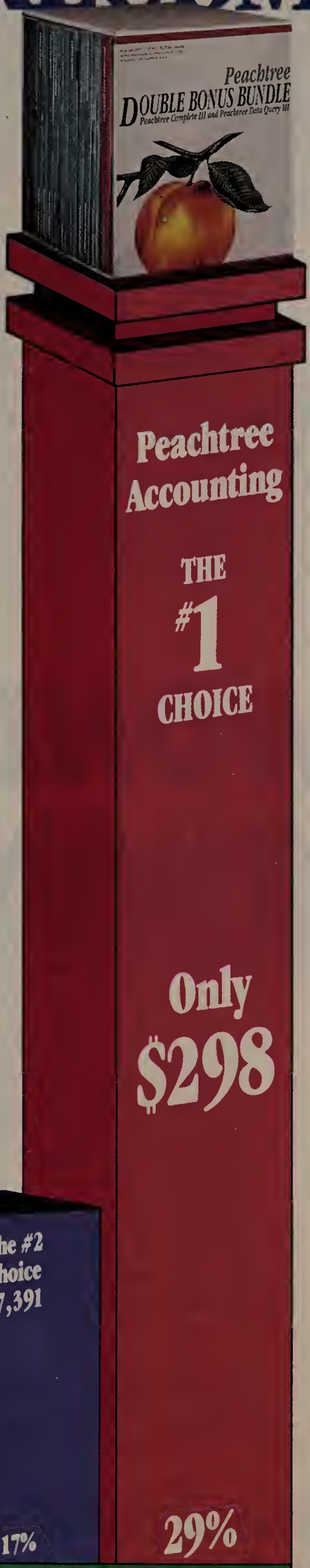
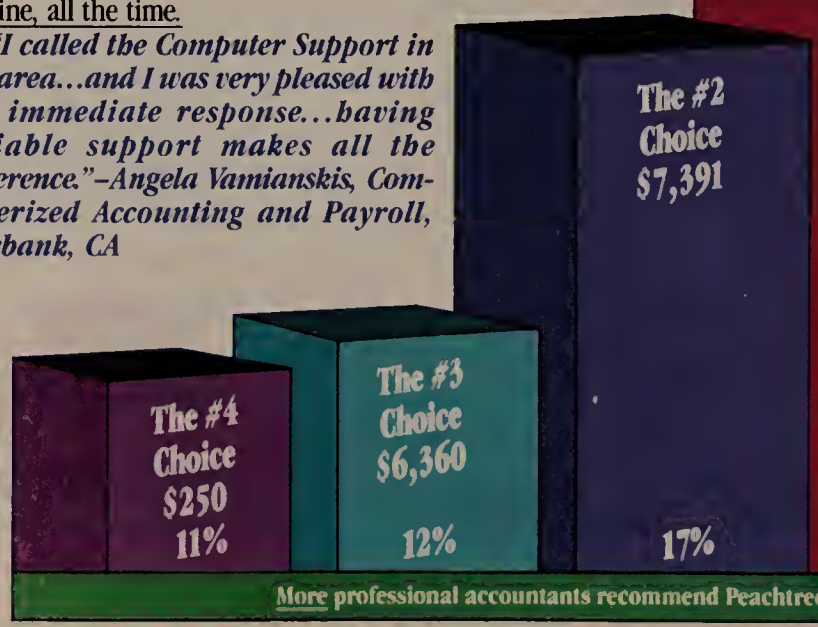
"Installation is easy, data entry is fast...a joy to use."–PC Resource, July 1990

With Peachtree, you don't have to give up ease of use to get the power and performance you need. The Double Bonus Bundle comes with on-line tutorials for each module and thorough documentation–an Accounting Primer, a quick-start Installation Guide, and a complete reference library–so you can get up and running quickly. Errors are handled with plain English messages and suggestions. Context-sensitive HELP is on-line, all the time.

"I called the Computer Support in my area...and I was very pleased with the immediate response...having reliable support makes all the difference."–Angela Vamianskis, Computerized Accounting and Payroll, Burbank, CA





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"...It's the only application I recommend. The package is superb..."–Marc Barlow, Executive Vice President, AdMedia, Largo, FL

PCW

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The Information Edge

Communications

On-line resources for business and professional users

This month: GEnie By Night offers something for everyone at penny-pinching prices, and Political Risk Service gives timely advice on doing business abroad.

Judy Heim

Cost is the biggest barrier to creative use of general-interest on-line services. If you want to cruise around on CompuServe, for instance, letting random drops of information sprinkle into your brain and condense into inspiration, high hourly costs can cramp your style. Happily, GEnie—General Electric's up-and-coming on-line service—combines eclectic offerings with off-hour prices that are the lowest in the industry. Moreover, GEnie's menu-driven user interface is the best in the business—and a *lot* easier to use than CompuServe's command line. If you download the Aladdin shell, your interaction with GEnie becomes even easier and more instinctive.

GEnie (whose 225,000 subscriber base is roughly 35 percent the size of CompuServe's 650,000) offers top-notch conferences on real estate, investment, law, medicine, and small business. There are also support conferences run by Microsoft, WordPerfect, Borland, Ashton-Tate, and dozens of smaller companies—although compared to CompuServe, GEnie's selection of technical conferences is quite a bit narrower. Each conference offers a library from which you can download related software and text files, and while these libraries are a lot smaller than those on CompuServe, that's not *entirely* bad news, since it won't take you hours to scan their holdings. You can also browse through a stock quotes data base and a wide-ranging news-clipping service. And the electronic mail system lets you upload binary files along with text messages.

Best of all, the price is painless. There's a $4.95 monthly charge, but after that, evening rates (6 p.m. to 8 a.m. on weekdays, all day on weekends and holidays) are only $6 per hour—less than half of CompuServe's round-the-clock $12.50 per hour. (GEnie's full-fare daytime rate is $18 per hour.) Incidentally, during those long off-hours you can access many of GEnie's features without incurring any hourly charges. These include E-mail, daily closing stock quotes, most GEnie conferences, and a generous selection of headline news—the top ten stories in a number of categories—from NewsGrid. NewsGrid draws its content from Reuters, AP BusinessWire, UPI, Deutsch Press-Agentur, Japan's Kyodo News Service, Xinhua News Agency, Agence France Press, and Agencia EFE. You can scan NewsGrid's wire stories for keywords of

ON-LINE SHORTCUTS

Waiting Forever With Procomm

Michael Goodwin

If you use *Procomm*'s Aspect script language but haven't pored over every line of the manual, you may run into trouble using the WAITFOR command. This useful function suspends a script until the remote system sends a specified string. For instance, if your script is designed to log on to CompuServe (CIS), download all your waiting E-mail messages, and log off, you'll need a line like **waitfor "!"** to keep the script from terminating until CIS sends its end-of-messages prompt.

The only trouble is that WAITFOR has a built-in 30-second default; if it doesn't receive the specified string within 30 seconds, it continues the script anyway. While the manual covers this point, it's easy to miss; most people assume the default is "forever." That false assumption will cause your download to terminate after 30 seconds even when there are still undelivered mail messages. Fortunately, there's an easy solution. Add the word "forever," making the line read: **waitfor "!" forever.**

THE PROFESSIONAL EDGE

Find Out If Political Risk Awaits Your Business Abroad

Who do you call when you want to find out whether it would be safe to open a branch office in Yemen? Unless you have Henry Kissinger's private number in your auto-dialer, the Political Risk Services dial-up data base (accessed via the Data-Star information service) is your best bet. This unique on-line service gives you the latest scoop on business conditions in turbulent foreign climes: politics, economics, industry, employment, banking—in short, everything that affects your ability to do business there.

Political Risk reports for each of 85 countries are authored annually and updated regularly by experts. The report on China, for instance, is written by a former ambassador, a former intelligence analyst, and a U.S. government analyst. Full reports run from 45 to 70 single-spaced pages.

Reports crackle with pragmatic detail. (For instance, did you know that Saddam Hussein considers Iraq's economic indicators to be government secrets? Or that Nicolae Ceausescu used to inflate statistics on Romania's harvests by 300 percent to depict rosy pictures of that economically devastated land?) Details include graphics of economic variables, risk ratings for individual countries, forecasts of what their business climates will be like in the years to come, and much more.

In addition, numerous U.S. government publications are available in their entirety, on line—including the State Department's *Background Notes*, the CIA's *World Factbook*, and the Commerce Department's *Foreign Economic Trends* and *Overseas Business Reports*.

Using the Political Risk data base on Data-Star is not cheap. There's a hefty $114-per-hour on-line charge, plus extra charges for viewing segments of text. Happily, you are not charged for viewing titles or tables of contents. In all, it costs approximately $300 to download a full report.

If that price seems high, you have some alternatives: You can download the first five summary pages of Political Risk reports from NewsNet for about $50. Some, but not all, Political Risk reports are available on Nexis through Mead Data for a good deal less. Nexis pricing is complicated, but if the report you want is there, it may only cost you about $110 to download it—in addition to a $50 monthly membership fee.

Despite its price and sundry quirks, the Political Risk data base is a gold mine of analysis on business arenas for anyone who barters or invests abroad. —*J. H.*

Data-Star; 485 Devon Park Dr., #110,Wayne, PA 19087; 800/221-7754, 215/687-0984 (fax)
Reader service no. 645

Mead Data Central, Inc.; P.O. Box 933, Dayton, OH 45401; 800/227-9597, 800/277-8379 Ohio, 513/865-6909 (fax)
Reader service no. 646

your interest. If you use the Custom Clipping Service option, news stories matching your search criteria will be waiting for you when you log on. NewsGrid is available on CompuServe, but you'll pay $27.50 an hour.

GEnie's Quotes Securities Database offers daily closing stock quotes free—that is, with no hourly charge. The standard and off-hourly rates buy you historical quotes back to May 1985, as well as the ability to create ten theoretical portfolios with 100 stocks in each, so you can watch the issues' daily gains and losses. The free daily quotes are a good deal; on Dow Jones News/Retrieval, stock prices with a 15-minute delay cost $1.46 per minute. But if you download a lot of historical quotes, you can probably do better with Worden Brothers' dial-up data base.

GEnie's native E-mail interface is serviceable, but little more. You start out in a menu, but once you begin writing a message you'll find yourself wrestling with slow-to-appear prompts and Pleistocene commands. On the other hand, if you use the interactive Aladdin front end—which lets you scroll through a received message in one window while you draft your reply in another—GEnie's E-mail becomes a joy.

GEnie's terrific interface, "free" access to E-mail, closing stock quotes, headline news, and wide-ranging conferences—and low, $6-per-hour off-hours rate—guarantee that any modem enthusiast will find enough on the service to make the time (and money) worthwhile. Who said CompuServe was the only game in town?

Judy Heim is a contributing editor and Michael Goodwin an associate editor for PC World.

WHERE TO BUY

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- ***PC World* - Best Buy 1989**
- ***Info World* - Best in Its Class 1988**
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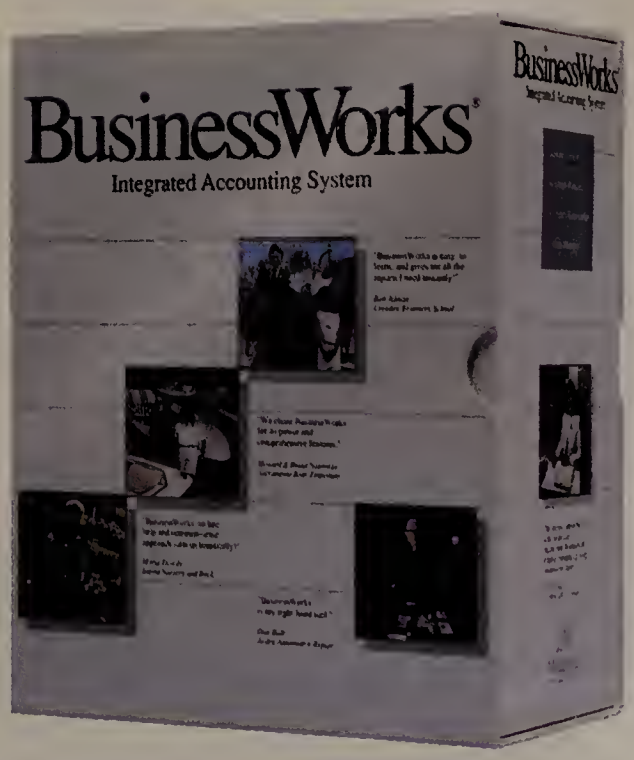
Call our toll-free number for the name of the dealer nearest you. Let BusinessWorks manage your books so you can manage your business.



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User Group Tips

Helpful hints from members of the nation's user groups

Making Room for Ventura Overflow

It's possible to start *Ventura Publisher* from a partition that lacks sufficient space (2MB) for *Ventura*'s temporary files. If your hard disk is partitioned, add the switch **/0=***x:* to the end of the DRVRMRGR line in your VP.BAT file, where *x* is the letter of the drive partition with the most free space. If you spend a lot of time working on large chapters, you may actually want to create a hard disk partition of 2MB or more to be used solely for *Ventura*'s overflow files.

Paul Stephen
Newsletter Editor
Winnipeg PC User Group Inc.

Jam-Free Postcard Printings on a Laser Printer

If postcards won't roll through your laser printer, it's rarely because they create a paper jam, as the LCD readout leads you to believe. Actually, the cards are just a bit too short to engage the next set of rollers that would keep them moving. Try taping two postcards together with removable tape, end to end or top to bottom, depending on whether you're printing in landscape or portrait mode. Then use your word processor to duplicate the message—with appropriate tabs for landscape printing or line spacing for portrait—so that two postcards print in one pass. Using this technique, I handle 50 response cards for small mailings easily—without a jam.

Dave Johnson
Chicago Area XyWrite Users Group

Resetting the Table for Better Paradox Performance

Brian J. Smith is correct when he says in October's *User Group Tips* that *Paradox* tables can become seriously fragmented—I've seen file sizes of large tables cut in half after defragmentation. Unfortunately, any SET (image-setting) files are deleted during restructuring. Also, *Paradox* creates intermediate tables to restructure a table, and a system error could irrevocably destroy an important table. (You have backups, right?) An alternate approach I believe to be safer and faster is to do a CHECK PLUS query on the table, empty the original, then add the answer table back to it. If there were a system crash, the answer table would still exist in your private directory. So before you exited *Paradox*, you'd use *Tools Rename Table* to rename ANSWER, as *Paradox* will delete answer tables when exiting or changing directories.

To create a script that will automate the defragmentation procedure, select *Scripts Editor Write*, type **defrag**, and then enter **LISTING 1**.

Select *DO_IT!* to save the script, select *View*, and enter name of the the table you wish to defrag. Select *Scripts Play*, type **defrag**, and press **<Enter>**.

Robin S. Rowe
Paradox SIG
Chicago Computer Society

```
; This script will defragment the
; current table on the work space.
IF SYSMODE()<>"Main"
OR IMAGETYPE()<>"Display"
THEN
RETURN "MUST VIEW TABLE FIRST!"
ENDIF
original=TABLE()
size=FILESIZE(original+".db")
MOVETO 1
WHILE IMAGETYPE()="Query"
MESSAGE "Clearing off old query"
CLEARIMAGE
ENDWHILE
MENU {Ask} SELECT original
CHECKPLUS
MESSAGE "Processing Query"
DO_IT!
IF IMAGETYPE()="Query"
THEN RETURN WINDOW()
ENDIF
MOVETO 1 CLEARIMAGE EMPTY original
MESSAGE "adding answer table to "+
original
ADD "Answer" original
MESSAGE "Flushing memory blocks"
RESET
RETURN "Recovered "+STRVAL(size-
FILESIZE(original+".db"))+"bytes"
```

LISTING 1: Enter this script to automate your defragmentation procedure.

Easier Envelope Printing With WordPerfect 5.1

WordPerfect 5.1's paper size command has a definition for envelopes, reducing the frustration of printing them. If you have a LaserJet-compatible printer, you may want to modify the margin settings: From within a document, press **<Shift>-<F8>ps** and highlight *Envelope-wide*. Press **eaym**, and set the left margin to 4 inches and the top margin to 2.25 inches; leave the others at their defaults. Press **<Enter>** several times to exit the document. From now on, to print an envelope, just press **<Shift>-<F8>ps**, highlight *Envelope-wide*, and then press **s** before you exit to your document.

Maralyn Henry
Upstate IBM-PC User Group
Greenville, South Carolina

Are you a user group member with a tip to share? Send it to User Group Tips, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). We pay $50 and throw in a* PC World *T-shirt for each tip we use—and you get to see your name in* PC World.

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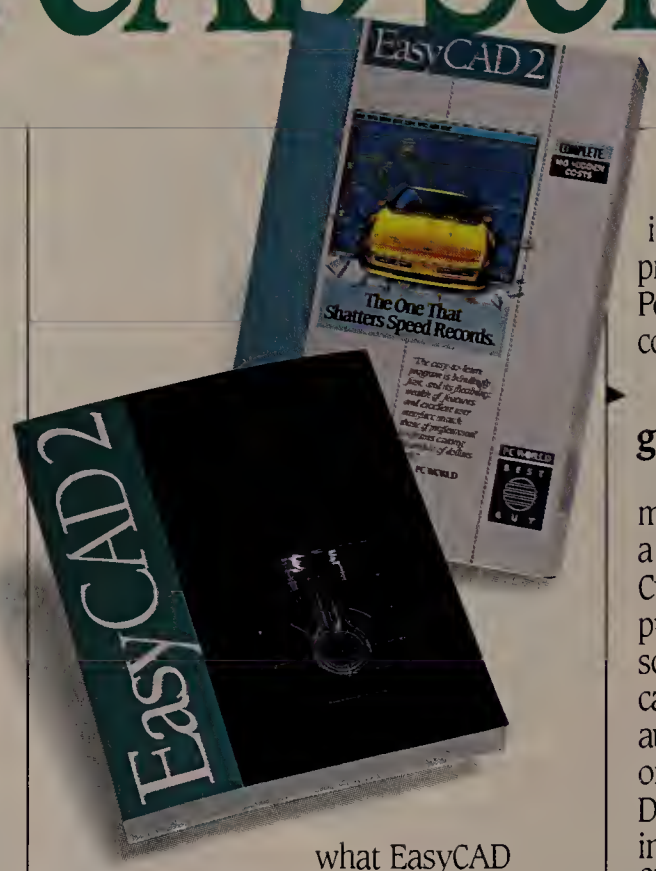

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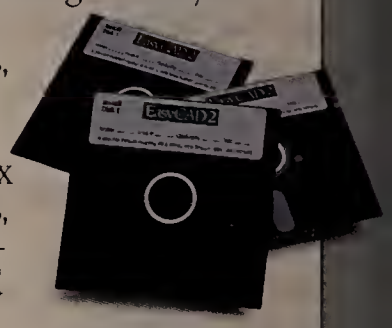

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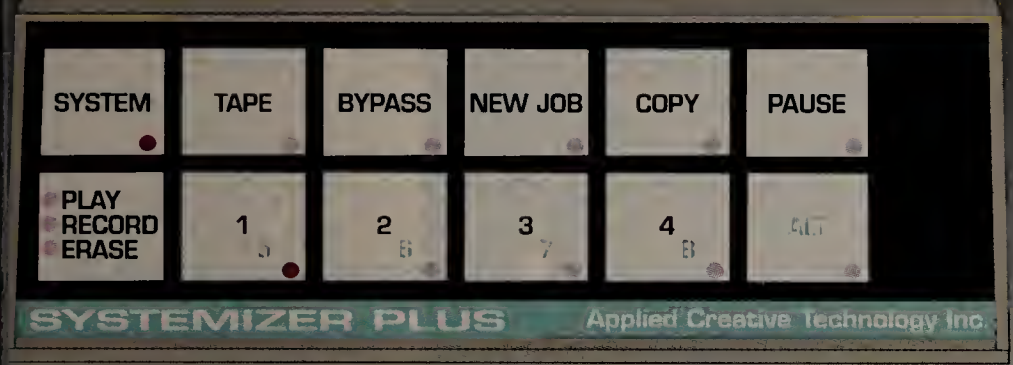
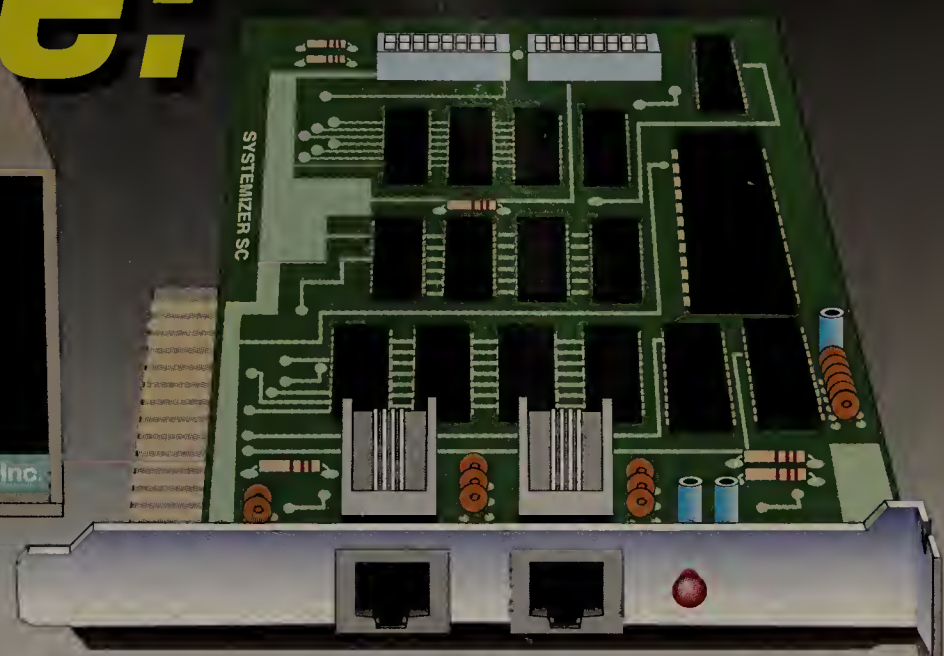


Several models available. The **Systemizer® Plus** shown above is an externally mounted networking module. Because it's self-contained and requires no software in the computer, it can work with practically any computer, operating system and application program.



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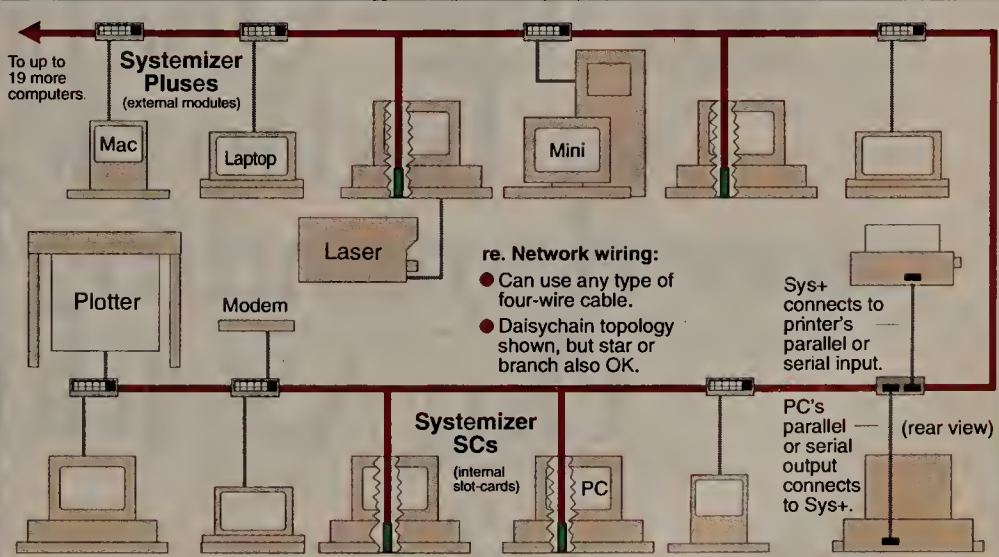

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Streamline font switches in Microsoft Word, create weekend warrior worksheets, use ATTRIB as an action-packed command, move aside text in WordPerfect, and fix RESET.COM.

Edited by Tom Swan

Finagling Fonts in Microsoft Word

Since I write for scientific and technical journals, I need to enter some unusual characters (like '▸') in *Microsoft Word* documents. These characters are available in some fonts—generally in the extended ASCII range—but not in others. In the past, I had to search through my text and manually select fonts and point sizes for each character to get them to print properly.

To simplify this tedious task, I wrote a macro (see **LISTING 1**) that searches for a character or a string of characters. Every time it finds a match, it changes the font and point size for the desired text so it will print correctly.

After starting the macro, you'll be prompted to type a character or string to modify. If you press <Enter> at this point, the macro will end. But if you enter a character or string, you'll be prompted for a font name, such as Courier or Elite, and then for a point size, like 12 or 14. If you press <Enter> at these two prompts, the defaults will be set to 12-point Courier. You can easily change these default values by substituting a different font name or size in the macro's 'set' commands.

Richard F. Laherty
Terre Haute, Indiana

Editor's note: Using this macro is a lot easier than setting up special characters with style sheets. Type the macro exactly as shown into a blank Word *document. Press* **<Ctrl>-[** *and* **<Ctrl>-]** *to enter the left and right chevrons (« and »). Highlight the entire macro, and press* **<Esc>Cnf.mac<Enter>** *to copy the text of the macro to the glossary and name it NF.MAC. Whether you save this file for future reference or discard it, be sure to save the glossary by selecting* Transfer Glossary Save *and pressing* **<Enter>**.

If you're not familiar with the fonts your printer has available, display a list of font names by selecting Format Character, *moving the cursor to 'Font name', and pressing* **<F1>**. *Press* **<Esc>** *to return to editing. To test the macro, load a document with characters to reformat. With the cursor at the top of the document, enter* **nf.mac**, *and press* **<F3>** *to execute the macro. Type in the text to modify, the font name you just selected, and the point size. The macro will search for and reformat every text match. Repeat this step for other text you want to change.*

```
«ask string=?Search for?»
«if string = ""»
«quit»
«endif»
«ask font=?Font name?»
«if font = ""»
«set font = "Courier"»
«endif»
«ask point=?Point size?»
«if point = ""»
«set point = "12"»
«endif»
<ctrl pgup>
<esc>S«string»<enter>
«while found»
<esc>FC<down 3>«font»<tab>
«point»<enter><right>
<esc>S<enter>
«endwhile»
```

LISTING 1: This Microsoft Word macro makes font changes quick and easy.

Worksheets for Weekend Warriors

Sometimes I need a worksheet column to list the weekdays—and only weekdays—in a given month. Instead of looking at a calendar and manually entering numbers, I came up with a trick that automatically lets my monthly forecasts skip weekends.

To use the technique, enter a year value such as **91** in cell C1. Enter a month number in the range 1 to 12 in C2. You can use other cells, but you'll have to alter the cell numbers in the method's formulas.

Next, go to cell C4 and enter this formula: **@IF(@MOD(@DATE(C1, C2,1),7) > 1,1,@IF(@MOD(@DATE(C1, C2,1),7)=1,2,3))**. Drop down one row to C5, and enter **@IF(@MOD(@DATE(C1, C2,C4+1),7) > 1,1+C4,@IF(@MOD(**

(continues)

ANTHONY RUSSO

@DATE(C1,C2,C4+1),7) = 1,2+C4, 3+C4)). Finally, replicate cell C5 to cells C6 through C26. This will display the weekday numbers for the month, which you can use in expressions or simply as row labels.

To skip holidays that occur during the week, simply enter the *next* day number manually. For example, if July 4 falls on a weekday, move to the cell with the '4' and enter **5** to replace the formula. Subsequent cells will adjust automatically to account for the change.

Leo Lefkowits
Houston, Texas

Editor's note: Copying the second formula to cell C26 lists 23 days, the maximum number of weekdays you can have in a month. When there are fewer than 23 workdays in a month, you'll get some 'ERR's at the bottom of the list. These are harmless and can be deleted if they annoy you.

A Is for Action

Dear Friends: In the item "Improving WHEREIS" [*Star-Dot-Star*, November 1989], John East reveals some, but not all, of ATTRIB's hidden possibilities. This command is the unexploited gold mine of DOS commands.

For example, ATTRIB lets you batch process a routine that otherwise must be done a file at a time. Suppose you have a program that accepts individual files for processing but can't handle wild cards. (We have many such programs in Russia—for example, PRRUS.COM, which I use to print Russian fonts.) The standard solution is to create a batch file that calls a program like PRRUS for each file in a directory. ATTRIB lets me create such batch files automatically.

First, I make a copy of the program file I want to run and rename it A.COM or A.EXE. Next, I copy to a temporary directory all the files I want to process (this isn't strictly necessary, but I recommend it as a safety measure). I then enter the command **attrib +a -r *.*** (or *.TXT, or whatever). This switches on the archive bit for each file. Then, I enter **attrib *.* > otp.bat** to create a batch file named OTP.BAT. You can use another name if you like. The file will contain lines like these:

A c:\path\filename1
A c:\path\filename2

The 'A' in these lines represents the file's archive flag, which the first ATTRIB command switched on. However, since I've renamed my executable file to 'A', executing the ATTRIB-created batch file passes all my file names to the program for processing, and I don't have to type a single one.

Vadim V. Kayuitkin
Sverdlovsk, U.S.S.R.

Editor's note: The '-r' option in the first ATTRIB command is needed only if

(continues)

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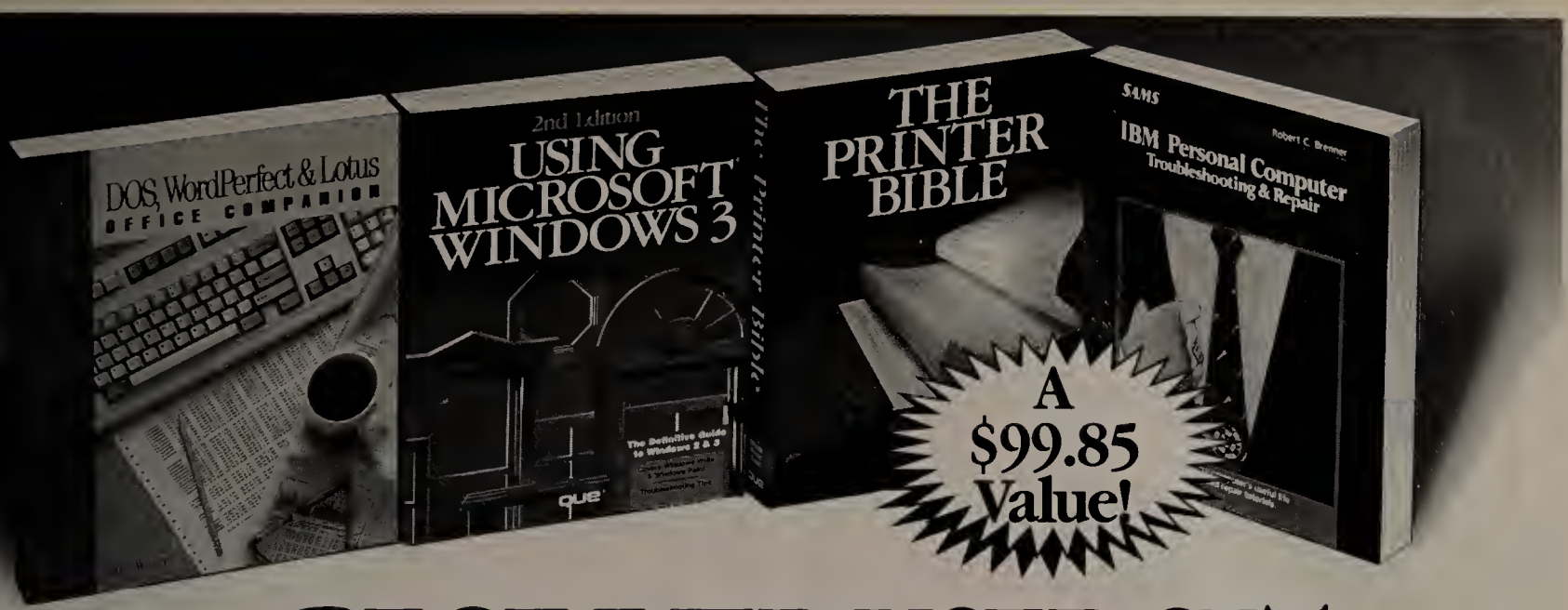

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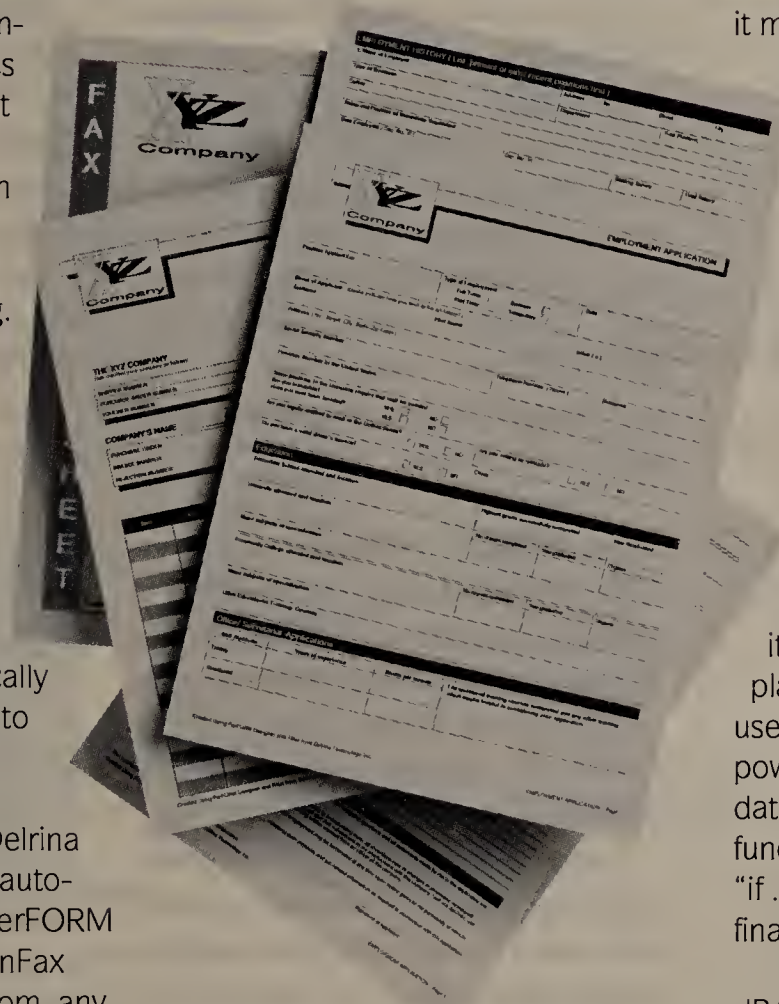

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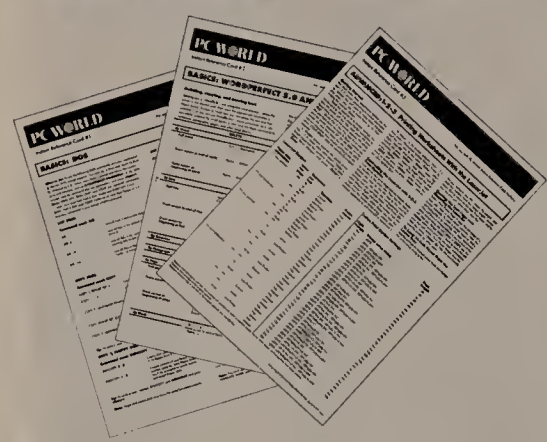

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some files are set to read-only status, but it does no harm to include this option, especially if you've copied your files to another directory first. DOS's read-only setting is pretty worthless, anyway; programs can circumvent it without even knowing it.

Be aware that renaming some programs may cause them to fail if they search for their own files—for configuration information, for instance. In that case, instead of renaming your program, edit the batch file, replacing each 'A' with your program's real name. Also, never change an executable program's extension. It's probably OK to rename MYPROG.EXE to A.EXE and MYPROG.COM to A.COM, but never rename an EXE extension to COM or vice versa. And whatever the program file is called, it must be in a directory on your PATH.

Try this tip even if you don't need to pass multiple files to programs in exactly this way. As Mr. Kayuitkin suggests, ATTRIB is truly golden for creating lists of file path names—a trick that no other DOS command performs with the same ease.

Move Aside, WordPerfect

A *WordPerfect 5.1* macro I designed is popular in our office. Maybe others will find it useful too. The macro performs a simple job—it inserts spaces to the *right* of the cursor, pushing aside any text that's there.

Since the macro contains programming commands to restore typeover mode and a variable, you have to use the macro editor to create it. To do this, first enter the keystrokes in **FIGURE 1**. This will create a new macro and place you in the macro editor. Press **<Delete>** to delete the {DISPLAY OFF} command currently assigned to the macro.

```
<Ctrl>-<F10>
<Alt>-I
Insert blanks<Enter>
<Ctrl>-<F10>
<Ctrl>-<F10>
<Alt>-IE
```

FIGURE 1: Enter these keystrokes to create the <Alt>-I macro for WordPerfect.

Now that you've got an empty macro, it's time to create the real McCoy by entering the text in **LISTING 2**. For the macro commands, shown here capitalized and in braces (as in '{IF}' and '{VARIABLE}'), press **<Ctrl>-<Page Up>** and select the command from the macro menu. To enter '{Typeover}', which is not specifically a macro command, press **<Ctrl>-V** and **<Insert>**. Enter '·{Left}' by pressing **<Space>**, **<Ctrl>-V**, and **<Cursor Left>**. Use **<Tab>** to indent the commands between {IF} and {ENDIF}. After typing the macro, press **<F7>** to exit the macro editor.

Stephen Schrank
Salt Lake City, Utah

Editor's note: To use the macro, load your document and move the cursor to where you want to insert spaces, then press **<Alt>-I**. *As you'll see, the cursor stays where it is instead of moving as it does when you insert blanks by pressing <Space>. This makes the macro a handy tool for aligning tables, creating stylized documents, or opening holes in lines for text or art.*

```
{ASSIGN}typeover{STATE}&256
{IF}{VARIABLE}typeover
 {Typeover}
{END IF}
·{Left}
{IF}{VARIABLE}typeover
 {Typeover}
{END IF}
```

LISTING 2: Use WordPerfect's macro editor to add these commands to the macro from FIGURE 1.

The macro also demonstrates how to preserve typeover mode if that mode is in effect when the macro runs. The commands save the current typing state, switch to insert mode if necessary, and then restore typeover mode before ending. You might want to keep this tip in mind for other macros that (continues)

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USING WINDOWS AND WORKSPACES

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Arronge windows	*Window Arronge oll*	**<Alt>WA**
Chonge window	Click on window; or *Window*, select from list	**<Alt>W**, press number of desired window; or **<Ctrl>-<F6>**
Hide current window	*Window Hide*	**<Alt>WH**

Fold Here

USING WINDOWS AND WORKSPACES (continued)

Unhide window	*Window Unhide*, double-click window nome	**<Alt>WU**, select window name if necessory, **<Enter>**
Sove new workspace	*File Save* workspoce, type nome of up to 8 chorocters, *OK*	**<Alt>FW**, enter name of up to 8 chorocters
Resove current workspoce	Change to oppropriate directory if necessary; *File Sove* workspoce *OK*	Chonge to appropriote directory if necessory; **<Alt>FW <Enter>**
Open saved workspace	*File Open*, double-click workspoce nome (XLW extension)	**<Ctrl>-<F12>** or **<Alt>FO**, **<Tab>**, select workspace nome, **<Enter>**

EDITING A CELL IN THE FORMULA BAR

What to do: Select a cell to edit; if using the keyboard, press **<F2>**. Then follow the directions to perform the desired action.

Action	Mouse	Keyboard
Move to for left	Click left edge of formula entry	**<Home>**
Move to for right	Click right edge of formula entry	**<End>**
Toggle insert/overtype	No mouse equivolent	**<Insert>**
Select character(s) or word(s)	Click and drog to select chorocters, or double-click and drog to select words	Hold down **<Shift>**, use **<Cursor Right>** for charocters or **<Ctrl>-<Cursor Right>** for words
Delete to end of line	No mouse equivolent	**<Ctrl>-<Delete>**
Calculate section of a formulo	Select section, *Options Calculote now*	Select section, **<F9>** or **<Ctrl>-<=>**

SELECTING AREAS OF THE WORKSHEET

Action	Mouse	Keyboard
Select o contiguous orea	Click corner cell ond drag pointer over desired area	**<F8>** or hold down **<Shift>**, use cursor keys to highlight ronge
Select entire column(s)	Click column letter ond drag os needed	Select any cell(s) in desired column(s), **<Ctrl>-<Space>**
Select entire row(s)	Click row number and drag as needed	Select any cell(s) in desired row(s), **<Shift>-<Space>**
Select entire worksheet	Click rectongle ot intersection of row ond column heodings	**<Ctrl>-<Shift>-<Space>**
Select noncontiguous oreos	Select the first ronge, column, or row; **<Shift>-<F8>**; select next areo(s)	Select first oreo, **<Shift>-<F8>**, select next area; repeat os needed

Fold Here

MOVING WITHIN SELECTED AREA(S)

Action	Keyboard
Up	**<Shift>-<Enter>**
Down	**<Enter>**
Right	**<Tab>**
Left	**<Shift>-<Tab>**
Next corner	**<Ctrl>-<Period>**
Next oreo	**<Ctrl>-<Tab>**
Previous oreo	**<Ctrl>-<Shift>-<Tab>**

Tip: If using a mouse, hold down **<Ctrl>** ond click desired location.

MANIPULATING DATA IN CELLS

Action	Mouse	Keyboard
Copy ond paste	Select ronge, *Edit Copy*, select upper left corner of destination, *Edit Paste*, **<Enter>**	Select range, **<Ctrl>-<Insert>**, cursor to destination, **<Enter>**
Cut and poste	Select ronge, *Edit Cut*, select upper left corner of destinotion, *Edit Poste*, **<Enter>**	Select range, **<Shift>-<Delete>**, cursor to destinotion, **<Enter>**
Erose	Select ronge, *Edit Cleor*, double-click what to clear, *OK*	Select ronge, **<Delete>**, choose what to cleor, **<Enter>**
Undo	*Edit Undo*	**<Alt>-<Backspace>**
Repeat most recent commond	*Edit Repeat*	**<Alt>-<Enter>**
Formot numbers, formulas	Select ronge, *Formot Number*, double-click formot	Select ronge, **<Alt> TN**, select formot, **<Enter>**
Align	Select range, *Format Alignment*, double-click alignment	Select ronge; **<Alt> TA**; **G**, **L**, **C**, **R**, or **F**; **<Enter>**

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Instant Reference Card #9

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MANIPULATING ROWS AND COLUMNS

What to do: First select the entire row(s) or column(s) you want to manipulate, then follow the directions to perform the desired action.

Action	Mouse	Keyboard
Insert row(s)/column(s)	*Edit Insert*	**<Ctrl>-<Plus>**
Delete row(s)/column(s)	*Edit Delete*	**<Ctrl>-<Minus>**
Set row height	Drag bottom border of any row heading	**<Alt>TR,** enter value
Set column width	Drag right border of any column heading	**<Alt>TC,** enter value

HANDY CONTROL-KEY COMMANDS

Key combination	Action
<Ctrl>-"	Copies value in cell above
<Ctrl>-' (closing single quotation mark)	Copies exact duplicate of formula in cell above to active cell
<Ctrl>-:	Enters current time
<Ctrl>-;	Enters current date

Fold Here

HANDY CONTROL-KEY COMMANDS (continued)

<Ctrl>-' (opening single quotation mark)	Toggles between formulas and values
<Ctrl>-1, -2, -3, or **-4**	Assigns Font 1, 2, 3, or 4
<Ctrl>-~	Assigns General format
<Ctrl>-!	Assigns 0.00 format
<Ctrl>-@	Assigns h:mm AM/PM format
<Ctrl>-#	Assigns d-mmm-yy format
<Ctrl>-$	Assigns $#,##0.00;($#,##0.00) format
<Ctrl>-%	Assigns 0% format
<Ctrl>-^	Assigns 0.00E+00 format
<Ctrl>-*	Selects current region
<Ctrl>-[	Highlights cell(s) in active worksheet to which the formulas in selected area refer

USEFUL CUSTOM FORMATS

What to do: Select *Format number* (**<Alt>TN**), highlight the Format edit box's current format string (**<Alt>-F**), then enter a custom format string. From then on, the custom format appears in the Format Number list box. To use the format, select the range you want to format, select *Format Number* (**<Alt>TN**), then use the cursor and page keys to select the custom format string and press **<Enter>**, or double-click on the format string.

Format	Format string
ZIP code	**00000**
ZIP plus 4	**00000-0000**
Telephone number	**000-0000**
Telephone number with area code	**(000) 000-0000**
Hidden numbers and text	**;;;**
Ellipsis following text entries	**@*.**
Left-justified dollar signs	**"$* #,##0;($* #,##0)"**
Cr for + values, Dr for – values	**#,##0 "Cr";#,##0 "Dr";**

DEFINING AND USING NAMES

Action	Mouse/Keyboard
Naming ranges	Select area to name, *Formula Define name*, enter name
Naming formulas	*Formula Define name*, enter name, **<Tab>**, enter formula
Naming constants	*Formula Define name*, enter name, **<Tab>**, enter constant (such as **=Acme Construction** or **=365**)
Link to external worksheet	To reference range SALES in C:\BUD\QTR1.XLS, use **=C:\BUD\QTR1.XLS!SALES**
Naming and using array	If you define array **Wages** as **={15,18,20}**, you can refer to the array's second value, 18, with **=INDEX(Wages,2)**

Note: Once you've defined a name, you can use it in a formula by typing the name or pasting it using *Formula Paste name*.

Tip: You can quickly jump to a named range by pressing **<F5>** and selecting the range's name from the list box.

Fold Here

WORKING WITH CHARTS

What to do: To create a chart, select the range to chart (include row and column headings), and press **<F11>** (or select *File New Chart*). The chart menu will appear; then follow the instructions below.

Action	Mouse/Keyboard
Change chart	**<Alt>G** (*Gallery*), select chart style and type of chart
Draw border	**<Alt>CC** (*Chart Select chart*) or **<Alt>CA** (*Chart Select plot area*), **<Alt>TP** (*Format Patterns*), select line weight, choose *Shadow* if desired, **<Enter>**
Add title to chart	**<Alt>CTT** (*Chart Attach text Chart title*), type in title (use **<Ctrl>-<Enter>** to add second line in title before pressing <Enter>)
Change fonts	Select chart item to change, **<Alt>TF** (*Format Font*), select desired font and style
Add legend	**<Alt>CL** (*Chart Add legend*)
Position legend	Select legend, **<Alt>TL** (*Format Legend*); **B**, **C**, **T**, or **V** (*Bottom, Corner, Top,* or *Vertical*); **<Enter>**
Add text to legend	Select chart element, edit SERIES formula to refer to cell containing legend text
Add grid lines	**<Alt>CG** (*Chart Gridlines*), select type(s) of grid lines for each axis
Add unattached text	Type the text, **<Enter>**, click and drag text anywhere in chart
Draw arrow	**<Alt>CR**, (*Chart Add arrow*), click and drag arrow endpoint(s)
Define preferred chart format for current session	Create and format chart, **<Alt>GT** (*Gallery Set preferred*)

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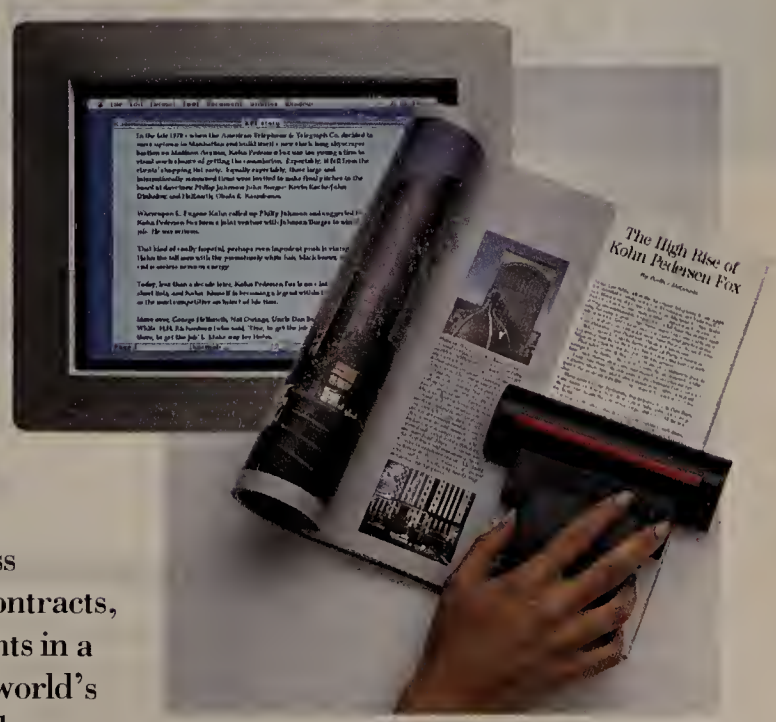

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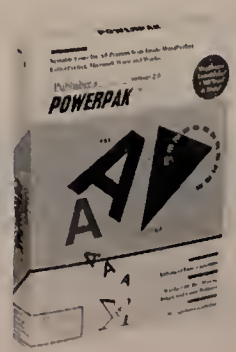

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need to switch typing modes.

Correction

In "Somebody, Stop That Printer!" (*Star-Dot-Star*, October 1990), the command to create RESET.COM should be **debug < reset.dat**. A printing error deleted the less-than sign between 'debug' and 'reset.dat', which tells DOS to direct the text from the data file to the DEBUG utility. Printed incorrectly (without the less-than sign), the command loads RESET.DAT into DEBUG. If this happens to you, type **q** and press **<Enter>** to return to the DOS prompt. Thanks to David A. Fusco, Arlington, Texas, for bringing this to our attention.

Tom Swan is a contributing editor for PC World *and the author of several books, including* Mastering Turbo Debugger *(Howard W. Sams, Carmel, Indiana, 1990).*

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POWER TIP NO. 164

Case of the Disappearing Word 5.0 Headers

Do your running heads disappear from sight after you format them with Format Running-head? If so, use the Options command to set Show Layout to No. This will bring your header lines back into view.

Tom Swan
Contributing Editor

A Pascal With Vision

Tom Swan

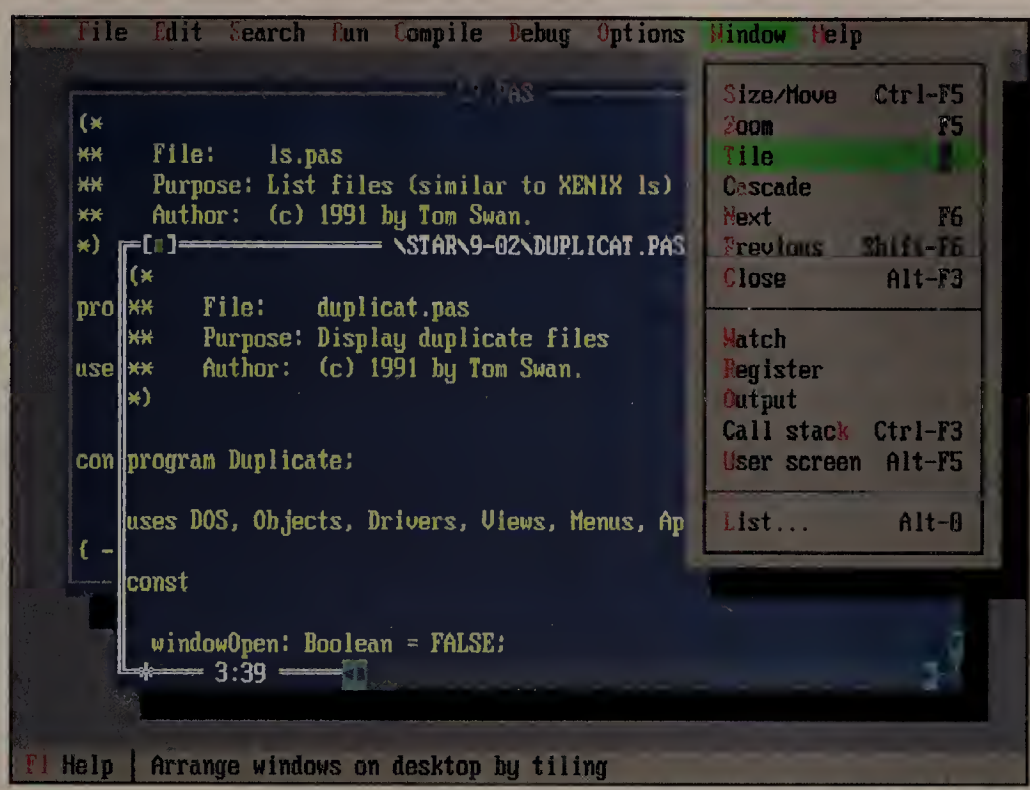
Here comes another version of *Turbo Pascal.* So, what else is new?

Plenty! For starters, Borland's *Turbo Pascal 6.0* features a revised integrated development environment (IDE) with mouse support and support for open multiple files. The IDE is a masterpiece —no other integrated package makes programming this easy. And no other compiler runs as fast. True to form, *Turbo Pascal 6.0* blazes through code.

But the big news is Turbo Vision—a bundled collection of objects that Borland calls its "application framework." And, to prove they're not foolin' around, Borland's programmers used these objects to write the new IDE from scratch. Now, *that*'s a commitment. With Turbo Vision, I can write programs that use the same kinds of windows, pulldown menus, and dialog boxes (among other items) that grace the IDE.

More on this in a bit. First, I should also mention several other new features. There's an in-line assembler that lets me embed assembly language in source files. A new directive generates 80286 op codes. Another lets me use functions as procedures. Objects can now declare private fields. And, to answer gripes from developers, Borland has restored a long-lost friend—version 3.0's heap memory manager. This should fix *Turbo Pascal 5.5*'s tendency to fragment the heap, leaving wasteful "holes" in memory.

As usual, you can purchase *Turbo Pascal* alone, or in a professional version with *Turbo Debugger 2.0, Turbo Assembler 2.0,* and *Turbo Profiler 1.0* (see "Developer's Toolbox," May 1990). *TP Professional* also includes a protected-mode command-line compiler that can process gigantic programs, but it needs an 80286 (or better) processor and at least 1MB of extended RAM. This version of the compiler is only for compiling large programs—it doesn't let you create protected-mode applications.



Turbo Pascal 6.0's new IDE, written with the bundled Turbo Vision object library, finally lets you open more than one file at a time.

Now, back to Turbo Vision—and a caution. Because of its sophisticated object-oriented nature, Turbo Vision is not just another handy-dandy subroutine package that lets programmers add pulldown menus and windows to spiff up their code. This is a highly complex package that will take skill, patience, and time to master.

One reason is that Turbo Vision creates a mouse-aware, event-driven environment—much like *Windows 3.0*'s—in which my programs run. Instead of responding directly to events like key presses and user commands, my code consists largely of objects that know what to do when they receive input. Turbo Vision takes care of the messy details for me—but only if I play by its event-driven rules.

And those rules are darn tough to learn. The first application I tried crashed after I added only a few innocent-looking lines of code. Eventually, I got a version working, but it wasn't easy.

Even so, compared to most other object-oriented libraries I've used, Turbo Vision represents a standard of excellence that will be hard to beat. Don't pass up this upgrade.

Let's talk it over. My MCI Mail handle is TSWAN; my CompuServe ID is 73627,3241.

WHERE TO BUY

Turbo Pascal 6.0
Borland Int'l
P.O. Box 660001
Scotts Valley, CA 95066
408/438-5300
LIST PRICE: Turbo Pascal 6.0 $149.95, Turbo Pascal Professional $299.95
REQUIREMENTS: Integrated Environment 512K, command-line compiler 256K, protected-mode compiler 1MB extended memory (professional version only), DOS 2.1 or later version
TECHNICAL SUPPORT: unlimited free support for registered users, toll number, M–F 9–5
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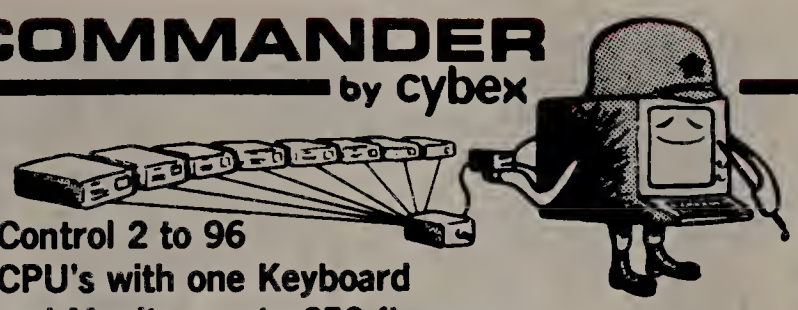

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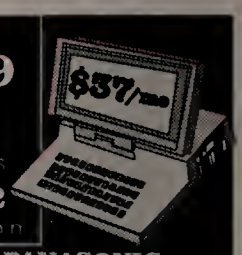

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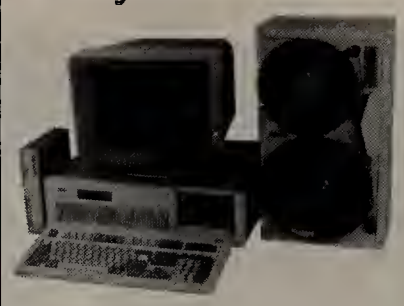

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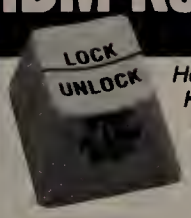

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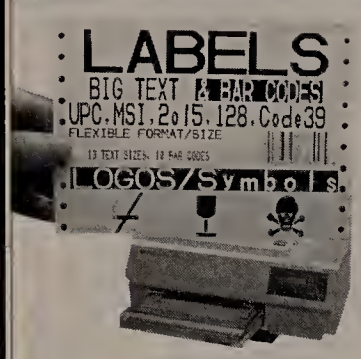

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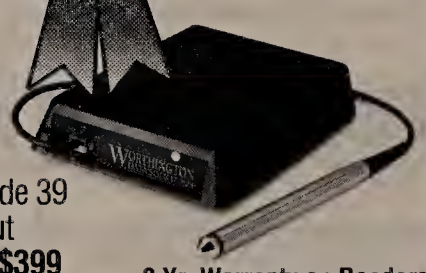

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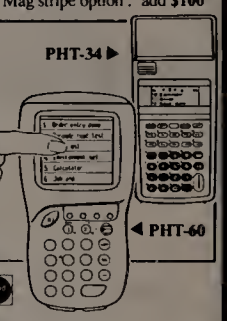

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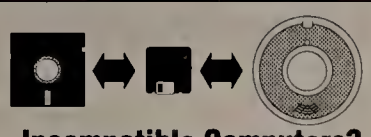

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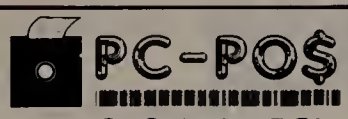

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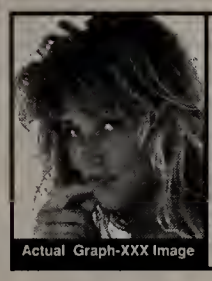
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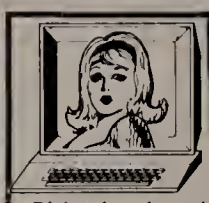

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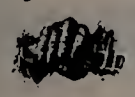

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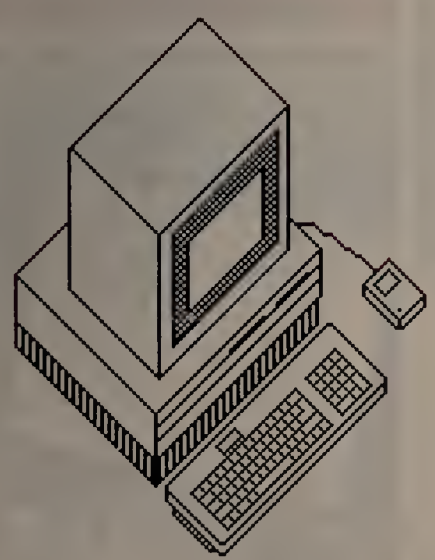

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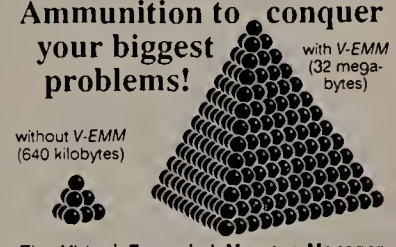

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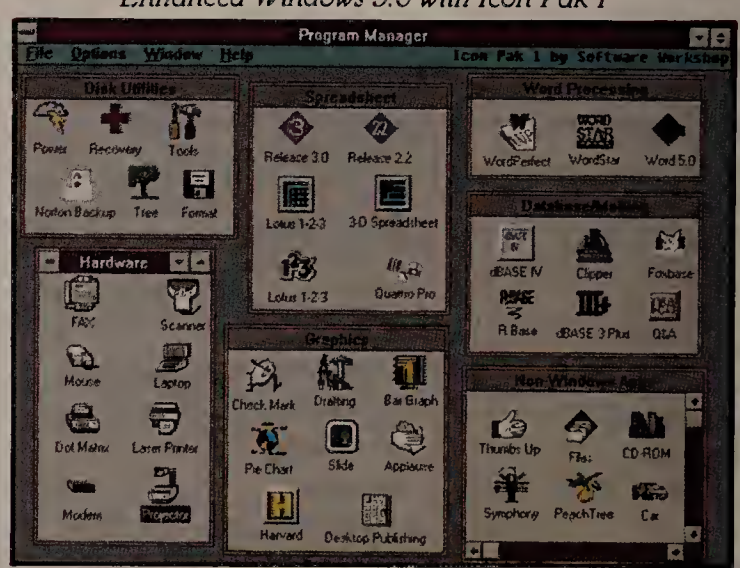

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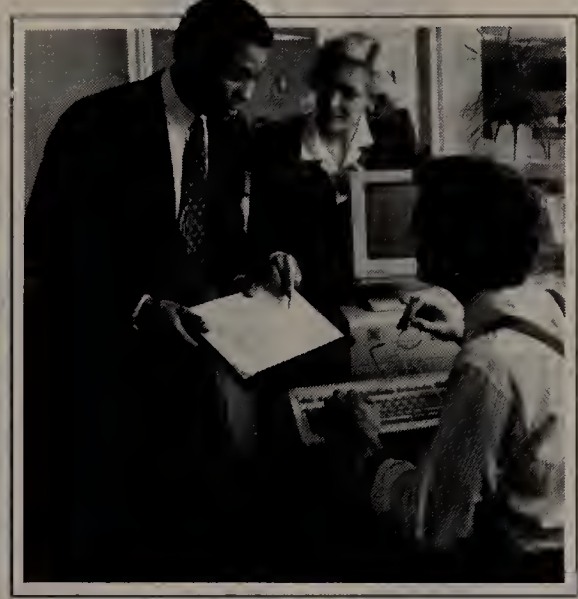

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256 X 1	1.25	1.40	1.60	1.85	—	—
256 X 4	—	5.00	5.25	5.60	6.25	7.50
1 Meg X 1	—	4.75	5.00	5.35	6.00	7.00

SIMM MODULES

DESCRIPTION	150	120	100	80	70	60
256 X 8	15.00	17.00	19.00	22.00	—	—
256 X 9	17.00	19.00	21.00	24.00	—	—
1 Meg X 8	—	43.00	45.50	46.00	55.00	65.00
1 Meg X 9	—	45.00	46.50	47.95	58.00	68.00
4 Meg X 8	—	—	299.00	349.00	429.00	499.00
4 Meg X 9	—	—	319.00	369.00	449.00	519.00

Add $1.00 for SIPP Module

IBM PS/2 MEMORY

PART NO.	DESCRIPTION	LIST	NSI
78X8955	128KB Upgrade PS/2 M25	50.00	28.00
30F5348	512KB Upgrade PS/2 30 286	200.00	54.00
30F5360	2M8 Upgrade PS/2 30 286	795.00	168.00
6450372	2MG Memory Adapter 6450367	1,295.00	395.00
6450603	1MG SIMM PS/2 70-E61; 121	450.00	82.00
6450604	2MG SIMM PS/2 50-70	950.00	129.00
6450608	2MG SIMM PS/2 70	950.00	150.00
34F2933	4M8 SIMM PS/2 55SX; 65SX	2,195.00	420.00
6450375	1MG Memory BD PS/2 80-041	675.00	96.00
6450379	2MG Memory Bd PS/2 80 111-321	950.00	179.00
6451060	4MG Mem Bd PS/2 80-A21; A31	1,895.00	479.00
6450605	2-8MG Mem Xpand PS/2 70&80 w/2MG	1,295.00	399.00
34F3077	2-14MG MemXpand PS/2 70&80 w/2MG	1,295.00	498.00
34F3011	4-14MG MemXpand PS/2 70&80 w/4MG	2,595.00	750.00
1497259	2-8MG Mem Xpand PS/2 50-65SX w/2MG	1,350.00	480.00

APPLE-MAC MEMORY

PART NO.	DESCRIPTION	LIST	NSI
MD248	1MG Module Mac Protable	450.00	249.00
N/A	2MG Module Mac Portable	2,095.00	690.00
N/A	3MG Module Mac Portable	3,095.00	1,049.00
N/A	4MG Module Mac Portable	4,095.00	1,399.00
MD218	1MG Kit Mac II, IIX, IICX	250.00	99.00
MD219	2MG Kit Mac II, IIX, IICX	450.00	118.00
MD292LL-A	4MG Kit Mac IICI	950.00	275.00
N/A	16MG Kit Mac IICI	6,996.00	1,499.00
MD376LL-A	4MG Kit Mac IIFX	950.00	294.00
N/A	16MG Kit Mac IIFX	6,995.00	1,389.00
M6005	1MG Memory Xpand Apple Laser Witer II-NTX	450.00	118.00
M6006	4MG Memory Xpand Apple Laser Writer II-NTX	950.00	329.00

TOSHIBA MEMORY

PART NO.	DESCRIPTION	LIST	NSI
PC10-PA8304U	2MG Memory Card Portable T5200 Toshiba Desktop T8500	950.00	189.00
PC12-PA8307U	2MG Memory Card Portable T3200SX	990.00	189.00
PC13-PA8306U	2MG Memory Card Portable T1200XE	1,195.00	309.00
PC14-PA8311U	1MG Memory Card Portable T1000SE-XE	650.00	275.00
PC14-PA8312U	2MG Memory Card Portable T1000SE-XE	1,195.00	359.00
PC15-PA8308U	2MG Memory Card Portable T3100SX	950.00	189.00
PC15-PA8310U	4MG Memory Card Portable T3100SX	4,395.00	589.00
PC6-PA7137U	3MG Memory Card Protable T3100	1,590.00	299.00
PC7-PA8301U	2MG Memory Card Portable T5100	1,190.00	189.00
PC8-PA8302U	2MG Memory Card Portable T1600	1,190.00	189.00
PC9-PA8340U	512K Memory Card Portable T3100E	350.00	119.00
PC9-PA8341U	2MG Memory Card Portable T3100E	1,190.00	189.00

AST MEMORY

PART NO.	DESCRIPTION	LIST	NSI
500510-000	512K8 Kit Fastram, Rampage/2, Xformer 286 Advantage, Advantage Pak, 6PakPlus	149.00	54.00
500510-001	512 Upgrade AST Premium 286-Fastram	155.00	54.00
500510-002	2MG Upgrade AST Premium W.S. 386SX Bravo 286-386SX, RPPLUS 286, Advantage 2 Advanced Fastram	260.00	99.00
500510-033	1MG Upgrade AST Premuim 386, RPPLUS-MC Advantage 386	260.00	99.00
500510-004	4MG Upgrade AST Premuim 386, RampagePlus/MC Advantage 386	790.00	336.00
500510-007	1MG Upgrade AST Premium 386C, 386-16	260.00	99.00
500510-008	4MG Upgrade AST Premium 386C, 386-16 W.S., 386SX, FastBd/386, Adv Fastram, RP 286	675.00	299.00
500510-010	512K Upgrade AST Premium W.S. 286, W.S. 386SX Bravo 286, Bravo 386SX, RPPLUS 286, Advantage 2	135.00	54.00
500510-011	128KB Upgrade Astbravo 286	50.00	26.00
500709-001	512KB Upgrade Advantage 2, Rampage PC	325.00	54.00
500709-003	512KB Upgrade RampagePlus-MC	135.00	54.00
500718-002	1MG Upgrade SIMM Ast Premium 386-25 486-33, 386-33, 386SX-16, 486-25T-25E	195.00	89.00
500718-004	2MG Upgrade SIMM AST Premium 486	850.00	269.00

LASER PRINTER MEMORY

DESCRIPTION		WORKS WITH	YOUR PRICE
1MB	33474A	HP Laser Jet IIP and III	89.95
2MB	33475A	HP Laser Jet IIP and III	129.95
4MB	33477A	HP Laser Jet IIP and III	204.95
1M8	33443B	HP Laser Jet II and IID	89.95
2M8	33444B	HP Laser Jet II and IID	129.95
4MB	33445B	HP Laser Jet II and IID	204.95
1MB	1039136	IBM Laser 4019	129.00
2MB	1039137	IBM Laser 4019	175.00
3.5MB	1038675	IBM Laser 4019	219.00
1MB	M6005	Apple LaserWriter II/NTX	85.00
4MB	M6006	Apple LaserWriter II/NTX	319.00
1MB	S63-1300	Canon L8P-8II Laser Printer	149.00
2MB	S63-1880	Canon LBP-8II Laser Printer	219.00
4M8	Part no. N/A	Canon LBP-8II Laser Printer	399.00

ZENITH DATA MEMORY

PART NO.	DESCRIPTION	LIST	NSI
Z-605-1	2MG Upgrade Z-386/SX	1,255.00	194.00
ZA-1B0-64	2MG Xpand Supersport SX, 286E	1,095.00	379.00
ZA-180-66	1MG Xpand Supersport 286, 286E	650.00	209.00
ZA-180-86	2MG Xpand Alpha Zenith, Supersport SX	1,095.00	379.00
ZA-3600-ME	1MG Upgrade Z-386/20, 25, 33, 33E	650.00	99.00
ZA-3600-MG	2MG Upgrade Z-386/20, 25, 33	1,250.00	169.00
ZA-3800-MK	4MG Upgrade Z-386/20, 25, 33, 33E	2,295.00	479.00

HEWLETT-PACKARD MEMORY

PART NO.	DESCRIPTION	LIST	NSI
D1354A	2MG Upgrade Vectra QS 16S, ES 12PC	950.00	199.00
D1540A	1MG Upgrade Vectra QS 16S	495.00	138.00
D1542A	4MG Upgrade Vectra DS 16S	1,950.00	379.00
D640A	1MG Upgrade Vectra DS 20PC, RS 25PC-20PC	450.00	198.00
D1642A	4MG Upgrade Vectra DS 20PC, RS 25PC-20PC	1,950.00	390.00
D2150A	1MG Upgrade Vectra 486 PC	450.00	129.00
D2151A	4MG Upgrade Vectra 486PC	1,950.00	599.00
D2152A	8MG Upgrade Vectra 3B6 25PC, 486PC	5,095.00	1,099.00
D2381A	2MG Upgrade Vectra 386 25PC	995.00	198.00

COMPAQ MEMORY

PART NO.	DESCRIPTION	LIST	NSI
107331-001	512K8 Upgrade Portable III	269.00	54.00
107332-001	2MG Upgrade Portable III	1,100.00	245.00
107651-001	1MG Upgrade Portable 386	650.00	205.00
107653-001	4MG Memory Xpand Portable 386	2,395.00	630.00
107654-001	4MG Memory Xtension Portable 386	2,395.00	630.00
108069-001	1MG Memory Xpand DP386-16	650.00	264.00
108070-001	4MG Memory Xpand DP386-16	2,395.00	630.00
108071-001	1MG Memory Upgrade DP386-16	635.00	120.00
108072-001	4MG Memory Upgrade DP386-16	2,550.00	360.00
110235-001	1MG Memory 8d Slt 286	650.00	180.00
110237-001	4MG Memory Bd Slt 286	2,195.00	949.00
112534-001	4MG Module DP386S-16	1,950.00	299.00
113131-001	1MG Module DP286E, 386 20-25E	450.00	96.00
113132-001	4MG Module DP286E, 386 20-25E	1,950.00	269.00
113633-001	1MG Memory Xpand DO386S-16	650.00	175.00
113634-001	4MG Memory Xpand DP386S-16	2,395.00	390.00
113644-001	1MG Memory Xpand DP386 20E, 25E	650.00	144.00
113645-001	4MG Memory Xpand DP386 20E, 25E	2,395.00	390.00
113646-001	1MG Module DP386S-16	450.00	110.00
115144-001	2MG Module DP386 33, 486 25, Syspro	950.00	180.00
116561-001	8MG Module 486 25, Syspro	4,495.00	1,325.00
116568-001	32MG Module DP486 25, Syspro	19,995.00	5,795.00
117077-001	512K8 Memory 8d Protable LTE	295.00	139.00
117081-001	1MG Memory 8d Portable LTE 286	650.00	129.00
117081-002	2MG Memory Bd Portable LTE 286	1,250.00	190.00
118688-001	1MG Upgrade DP286N, 386N, 386S-20	275.00	119.00
118689-001	2MG Upgrade DP386N, 386S-20	575.00	205.00
118690-001	4MG Upgrade DP286N, 386N, 386S-20	1,095.00	480.00

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with DK **$149**
with 2MG **$249**

BOCARAM 30 - Provides up to 2MG of expanded memory for I8M PS/2 model 25, 30 and B-bit bus that utilizes 3.5in. floppy disks. Uses 256K D-RAM/
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with DK **$149**
with 2MG **$249**

BOCARAM 50/60 - Provides up to 4MG expanded, extended or backfill memory for PS/2 model 50, 60. Uses 1MG D-RAM/
with DK **$149**
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586 25 MHZ	1 mg Ram, 1.2 floppy	$1099
386 25 CACHE	4 mg Ram, 1.2 floppy	$1599
386 33 CACHE	4 mg Ram, 1.2 floppy	$1899
486 25 CACHE	4 mg Ram, 1.2 floppy	$2999

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286 Desk Pro 12 MHZ	$1499
III 20/40	$3465/$4159
286E 40/100	$2320/$2869
386S 1/40	$2220/$2919
386-25 110/300	$6399/$8565
386 20E 40/100	$4265/$4865
Port. 386 40/100	$4960/$5665
SLT 20/40	$3865/$4219

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Toshiba 1000SE	$1149
Toshiba 1000XE	$1599
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Toshiba 1200XE	$2299
Toshiba 1600X 20/40	$2429/$2899
Toshiba 3100SX 40/80	$3999/$4499
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Toshiba 5200 40/100	$4699/$4999
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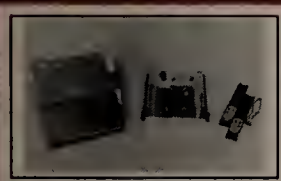

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	PRO-386/25	PRO-386-25C	PRO-386/33C
Processor	Intal 80386 running at 25MHz	Intal 80388 running at 25MHz	Intal 80388 running at 33MHz
Memory	2MB standard. Expandable lo 8MB on board (or to 16MB using 32-bit expansion board); PRO-386/25 non-cache system direct support LIM/EMS 4.0 from hardware	2MB standard. Expandable to 8MB on board (or to 16MB using 32-bit expansion board); PRO-386/25 non-cacha system direct support LIM/EMS 4.0 from hardware	2MB standard. Expandabla to 8MB on board (or to 16MB using 32-bit expansion board); PRO-386/25 non-cacha system direct support LIM/EMS 4.0 from hardware
Cache		64K direct map sat-associative cache using 35ns RAMs	64K direct map set-associative cacha using 25ns RAMs
Coprocessor Support	Intel 80387; Weltеck	Intal 80387; Weiteck	Intal 80387; Weltеck
Other Features (All Computers)	5¼" 1.2MB or 3½" 1.44MB floppy disk driva IDE controller supports 2FDD/2HDD Two serial, one parallel port Six 16-bit, two 8-bit, ona 32-bit axpansion slots Real-time clock/calendar with battery backup AMI-BIOS 101-kay anhanced keyboard		
Optional	Chinon Internal CD-ROM	Chinon Internal CD-ROM	Chinon Internal CD-ROM
Power Meter 1.2	4.04 MIPS	5.80 MIPS	7.63 MIPS
Basic w/VGA Monochrome & 40MB IDE Hard Disk	$1659	$1959	$2259
Basic w/VGA 1024x768 Color & 40MB IDE Hard Disk	$1899	$2199	$2499
Basic w/VGA Monochrome & 80MB IDE Hard Disk	$1839	$2139	$2439
Basic w/VGA 1024x768 Color & 80MB IDE Hard Disk	$2079	$2379	$2679
Basic w/VGA Monochrome & 200MB IDE Hard Disk	$2329	$2629	$2929
Basic w/VGA 1024x768 Color & 200MB IDE Hard Disk	$2569	$2869	$3169

	PRO-286/16	PRO-386SX/16	PRO-386SX/20
Processor	80286 Microprocessor running at 18MHz with zero-wait state	Intel 80386SX Microprocessor running at 16MHz with zero-wait stata	Intel 80386SX Microprocessor running at 20MHz with zero-wait state
Memory	1MB standard Expandable to 4MB on board (or to 16MB using 16-bit expansion board); Supports LIM/EMS 4.0	1MB standard Expandable to 4MB on boerd (or to 16MB using 16-bit expansion board); Supports LIM/EMS 4.0	1MB standard Expandable to 4MB on board (or to 16MB using 16-bit expansion board); Supports LIM/EMS 4.0
Coprocessor Support	Intel 80287	Intel 80387SX	Intel 80387SX
Expansion	Five expansion slots	Six 16-bit and two 8-bit	Six 16-bit and two 8-bit
Other Features	5¼" 1.2MB or 3½" 1.44MB floppy disk drive Two serial, one parallel port Real-time clock/calendar with battary backup AMI BIOS 101-key enhanced keyboard Shadow RAM Support		
Basic w/VGA Monochrome & 40MB Hard Disk	$1109	$1249	$1394
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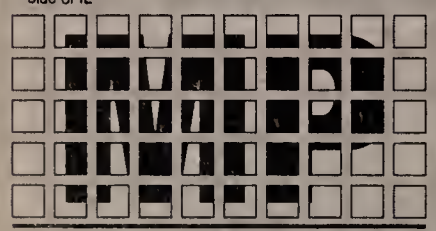

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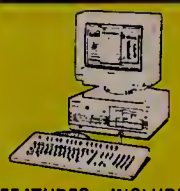

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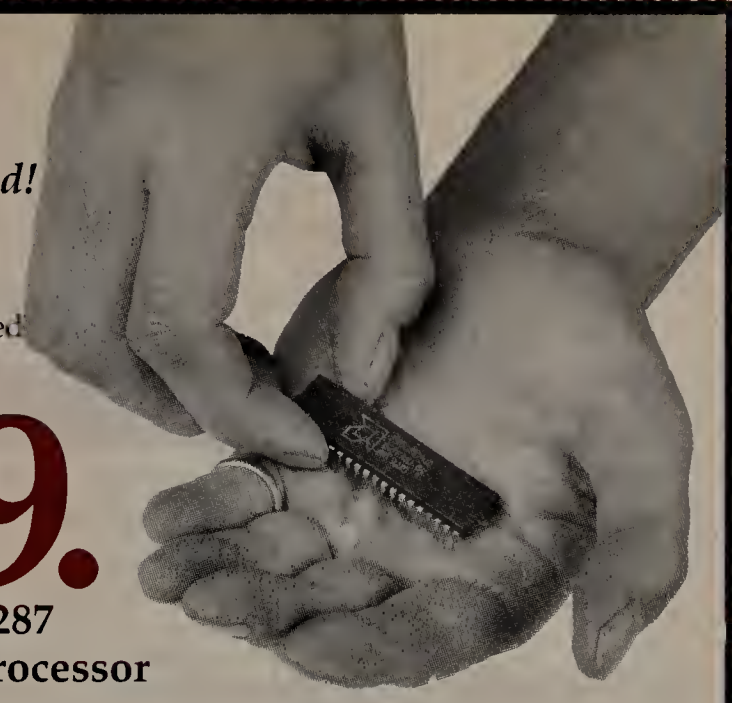

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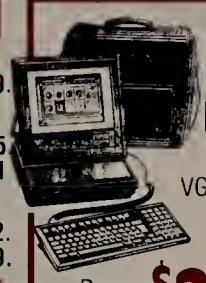

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- ☐ **Play 'n' Learn 2.12 (1735)** – A collection of six programs for children 18 months to 4 years. (CGA)
- ☐ **Typing Teacher (1425)** – Five great programs designed to improve the speed and accuracy of your typing!
- ☐ **World 2.99 (1849)** – The ultimate globe! Learn about cities, countries with this computerized globe. (CGA)
- ☐ **Tutor DOS (4 disks) (1450)** – The ultimate DOS tutorial. Everything you wanted to know about DOS and more! (HD)

GAMES

- ☐ **Arcade Games 1 (1811)** – Pac-man (3 versions!), Hopper, Space Invaders, Fusion (Tetris variation), etc. (CGA)
- ☐ **Arcade Games 2 (1812)** – Double Blocks (another Tetris variation), Q-Bert, Breakout, Beast and others. (CGA)
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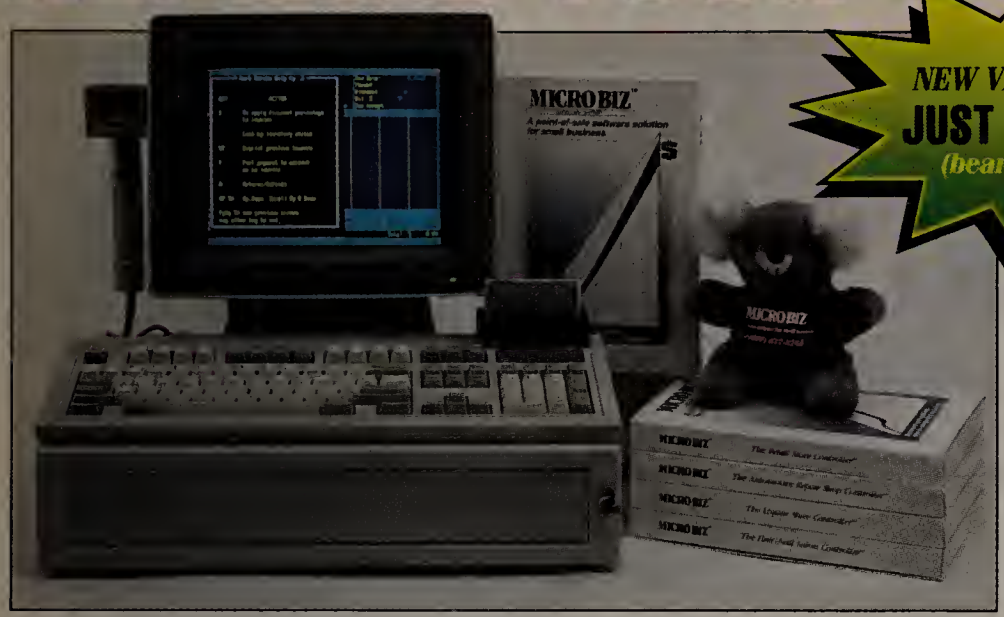

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- ✔ pull down menus
- ✔ pop-up windows
- ✔ source code available
- ✔ 99 levels of password protection
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- ✔ prints bar code labels
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- ✔ extensive sales reports
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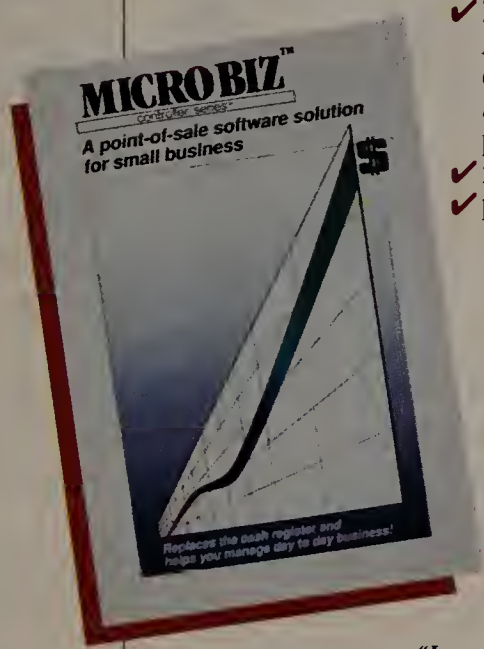

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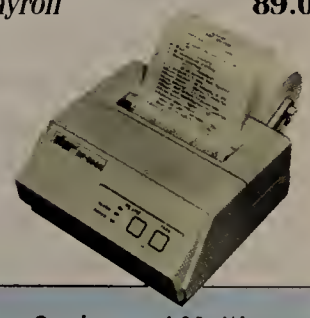

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TAKING IT HOME

The practical guide to home/office computing

Nightmare on Your Street, Part II: Computer Insurance

Steve Bass

You never think your hard disk will crash until it crashes; you never think your computer can be stolen until you come home to find your house ransacked. "Nightmare on Your Street, Part II" begins when you try to get your insurance company to reimburse you.

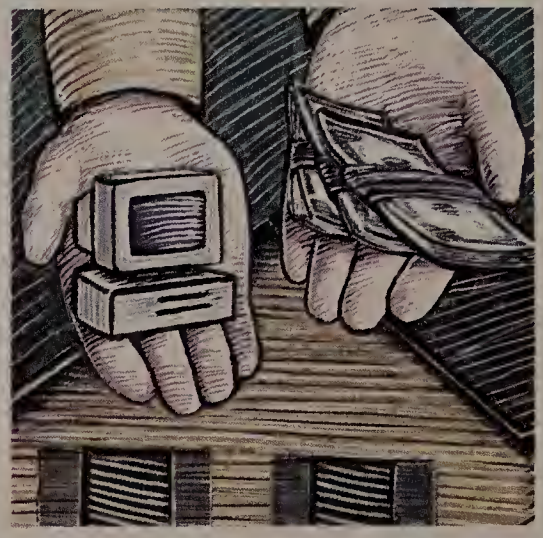
Before we get to that, though, let's talk about something even more important than money, something no one can give you back—your data. Even Freddy will tell you, there's only one kind of insurance for your files: making backups. I know that's good advice often ignored—like taking your vitamins and flossing after meals—but at least do an incremental backup onto floppies after every computing session.

As for your friendly insurance agent —never mind what the TV commercials portray, getting money out of him will be a hassle. He'll expect you to have documented your entire computing history, right down to your last floppy disk purchase. And he'll need all of the receipts to determine the age and purchase price of your equipment and software, so you'd better make photocopies. Last year a water main broke and flooded my office, but fortunately, I keep photocopies of my office receipts at home and vice versa.

ANTHONY RUSSO

You may need homeowner's or business insurance or both, depending upon how much equipment you have at home and what you're doing with it. If you're an employee taking work home, your employer's policy may cover you. If not, carefully review your homeowner's or renter's policy to see if your computer is covered.

My homeowner's policy covers up to $5000 of computer equipment, whether I use it for business or, as my wife insists is more likely, for playing games. That's not enough coverage for me, but thanks to a long chat with a claims adjuster, I've learned that my Allstate business policy has no limit on computer equipment, whether it's used at the office or at home. The policy even includes $5000 worth of coverage for data and software attacked by a virus. If you're self-employed, your business policy alone might do the job.



MARC TAFFET

The premium for computer insurance is about $10 per $1000 of equipment. How much coverage you need depends upon such factors as your individual situation and your home's location, construction material, fire protection class, and cost of replacement. The nonprofit Insurance Information Institute has a Consumer Hotline that can send you a worksheet to help determine your insurance needs, and your state insurance commissioner can give you data about various insurance carriers.

I chose my carrier years ago after surveying friends, reading through back issues of *Consumer Reports*, and interviewing dozens of *independent* agents. But every year at renewal time, I collect at least three additional quotes just to be sure that my policy is still competitive.

Even though I have a replacement policy, my insurance company first pays me only the *actual cash value*—the replacement cost less depreciation according to their product guidebook. I have to submit receipts proving that I've replaced the items before they'll make a final payment, and I have only six months to do it.

Find out if excessive losses will raise your deductible or cause your policy to be canceled. Allstate labeled us a "high risk" after two burglaries in two years. We were forced to have a security system installed before they'd renew our homeowner's policy.

It's hard to love insurance companies, but they're necessary evils in an adverse world. Review your policy regularly, keep it up-to-date, and if you're lucky, Freddy won't visit your house—in any of his disguises.

Steve Bass is a contributing editor for PC World.

Insurance Information Institute's Consumer Hotline, 800/942-4242

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☐ 386-based systems ☐ Laptops
☐ 386SX-based systems ☐ Other: _____
☐ 486-based systems

2. Are you interested in computer products for:
☐ Home ☐ Business ☐ Resale

3. How many PCs does your company plan to purchase in the next twelve months?

Quantity	Timeframe	Quantity	Timeframe
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_____	1-3 months	_____	More than 12 months
_____	3-6 months		

4. What do you plan to use computer products for?
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5. How many PCs do you have installed now at your company?
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6. Are you interested in leasing? ☐ Yes ☐ No

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(CONT'D FROM BACK PAGE)

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Then you get 30 days to use it. If you aren't satisfied, send it back. We'll return your money, no questions asked.

Even if something goes wrong, it won't wreck your day. Actually, one of the nice things about our service is that you'll rarely need it. Another *PC Week* poll category we dominate is the one called "reliability"— due in no small measure to our extensive burn-in testing on each computer before it goes out the door.

But, for the sake of argument, let's suppose something does go wrong with your Dell computer. Both the Dell 333D and 325D come with our SmartVu,™ the built-in diagnostic display, that ingeniously identifies problems even if the monitor goes down.

If you still need help, our Dell toll-free technical support hotline solves 90% of all problems over the phone, often within 4 or 5 minutes. Or, if you use our new Dell TechFax line at 1-800-950-1329, we'll fax back technical information immediately.

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